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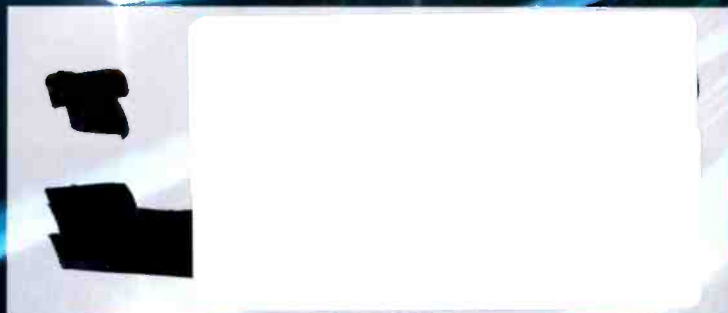
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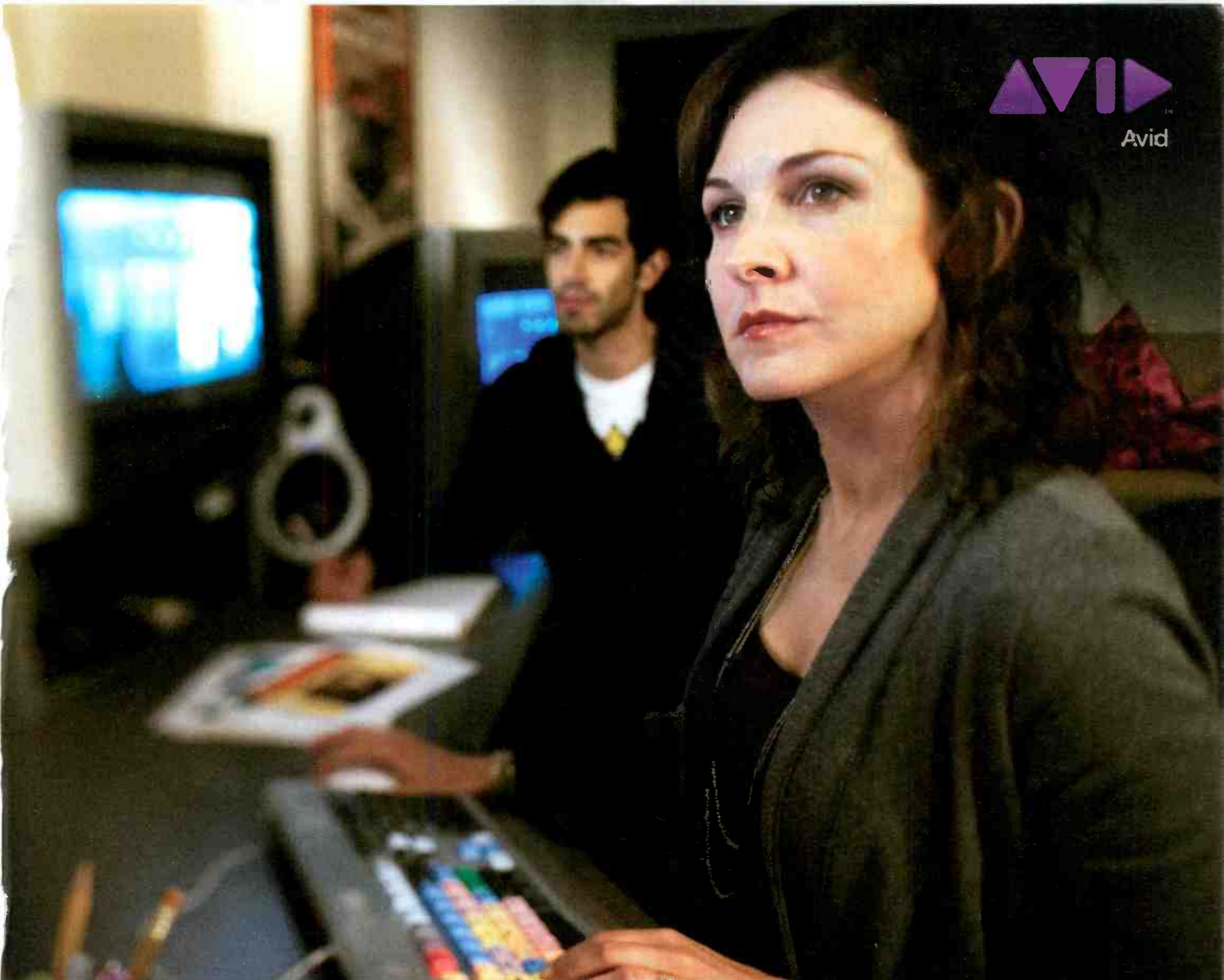
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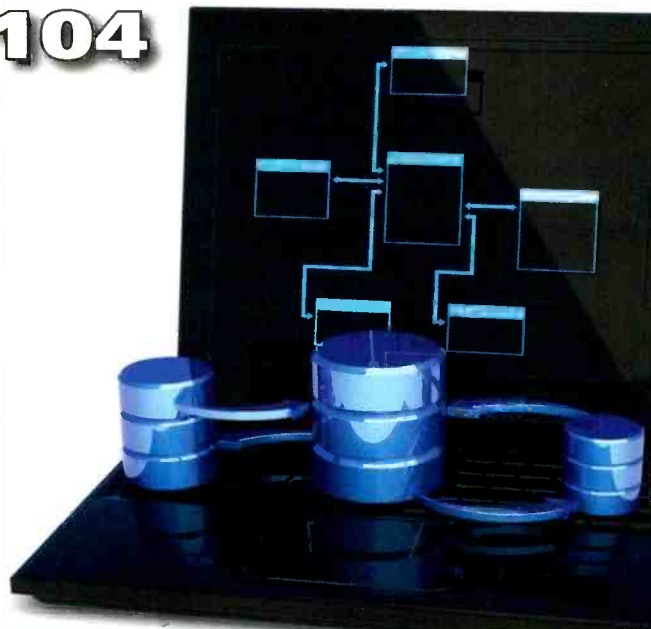


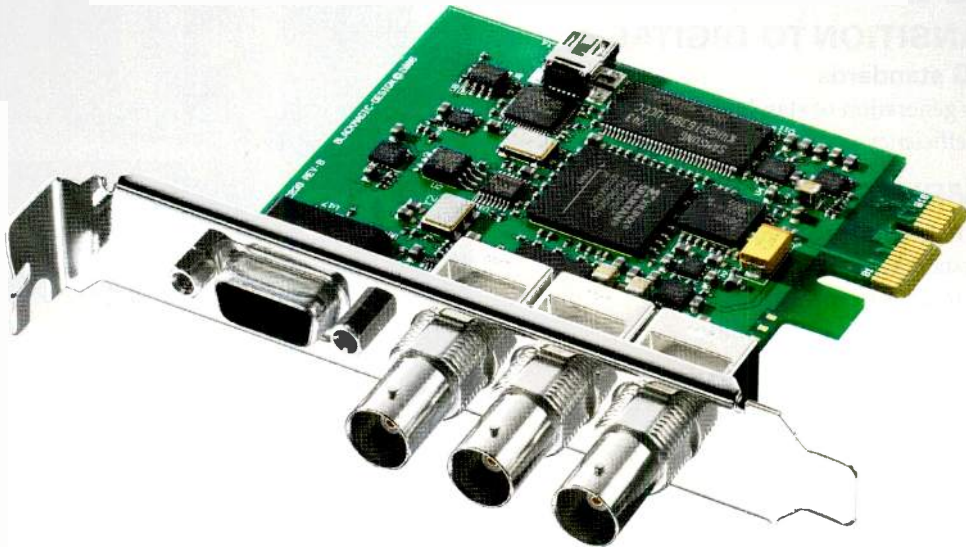
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With so many different configurations and connector types now available, the cost of fiber has never been lower.

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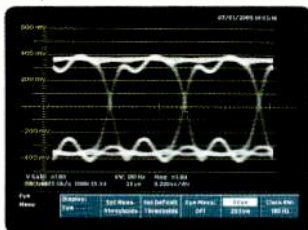
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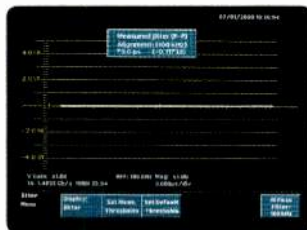
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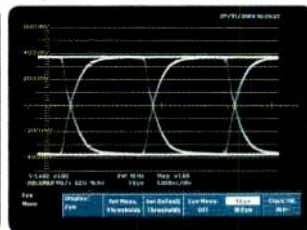
SDI Eye Pattern in HD



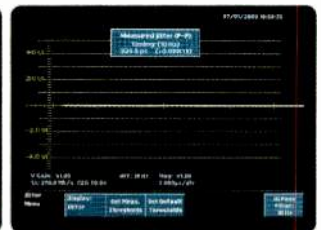
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Opportunity knocks

One might think that engineers, production staff and station management would be eager to adopt new ways of operation and the latest technology. This is not necessarily the case. How often have you heard someone, often an engineer, say, "If it ain't broke, don't fix it," meaning, why adopt new technology when existing technology works just fine? But while change may be difficult, it often represents the path to new opportunity.

As viewers increasingly demand new ways to consume content, the broadcast industry can either provide those new channels of delivery or watch as others step in to fill



that need. Let's look briefly at how some of the industry's competitors are addressing new content delivery models:

- By 2013, online advertising will overtake newspapers as the second-largest ad-spending category. In just two years, online advertising will total about \$117 billion.
- Global advertising revenue for online is predicted to increase by almost 20 percent each year through 2016.
- Mobile TV advertising will total \$2.7 billion by 2013 and is expected to grow at a similar pace with online video.
- In addition to new growth markets, video and TV advertising will continue to reign over all media. While online ads are growing faster, traditional TV advertising will still command a 40 percent share of all advertising dollars and increase annually by 7.5 percent through 2016.

Who will gain from these new opportunities?

Broadcasters clearly can benefit, but only if they're willing to invest in the technology required to deliver the new channels. Are there others competing to enter these new spaces?

You bet.

Online video continues to demand an increasing amount of viewer engagement time. In the last quarter of 2010, newspapers for the first time surpassed broadcasters in total minutes streamed. This interesting development proves that the "dying medium" is rapidly adopting broadcast technology and now producing more video content than TV stations.

The data shows key differences in the content produced by the two verticals, however. Broadcasters provide fewer but longer titles. Newspapers produce many more, but shorter, titles on a more regular basis. News directors must be scratching their heads.

In addition, the number of people in the United States watching online video has steadily risen over the past few years. Research firm eMarketer projects that 77 percent of Internet users in 2014 will be watching online video content at least monthly. Factors driving the consumption of longer-form video are new over-the-top (OTT) boxes and services that are now available.

Here are just some of the ways viewers can connect with streamed content:

- Boxee, a media streaming device, provides access to more than 100 feeds, including Vudu, NHL, MLB and Flickr.
- Roku, the \$100 cord-cutting enabler, provides access to Netflix, the MLB, the NBA and Amazon.
- Apple TV is perfect for those who religiously embrace iOS.
- And, there are more than 200 other devices capable of accessing streaming content.

Additionally, there are the streaming networks:

- In March 2010, 135.3 million viewers watched 12.9 billion YouTube videos, which equates to 95.6 videos per viewer.
- Hulu was second in the number of videos according to ComScore, serving up 1.1 billion videos in March 2010.
- Amazon's Instant Video, a \$79/year service, provides access to 5000 streaming videos and TV programs.
- Netflix, a \$95/year service, delivers 61 percent of all digital video and claims access to more than 20,000 movie titles.

Finally, changing viewer demographics will affect who comes out on top. The highest penetration of online video viewing is in the 18-34 age group. Within three years, the penetration of these online viewers will exceed 90 percent. And as these viewers age, they will be quite comfortable with alternative ways to access content.

Broadcasters need to decide now if they want to answer that knock at the door.

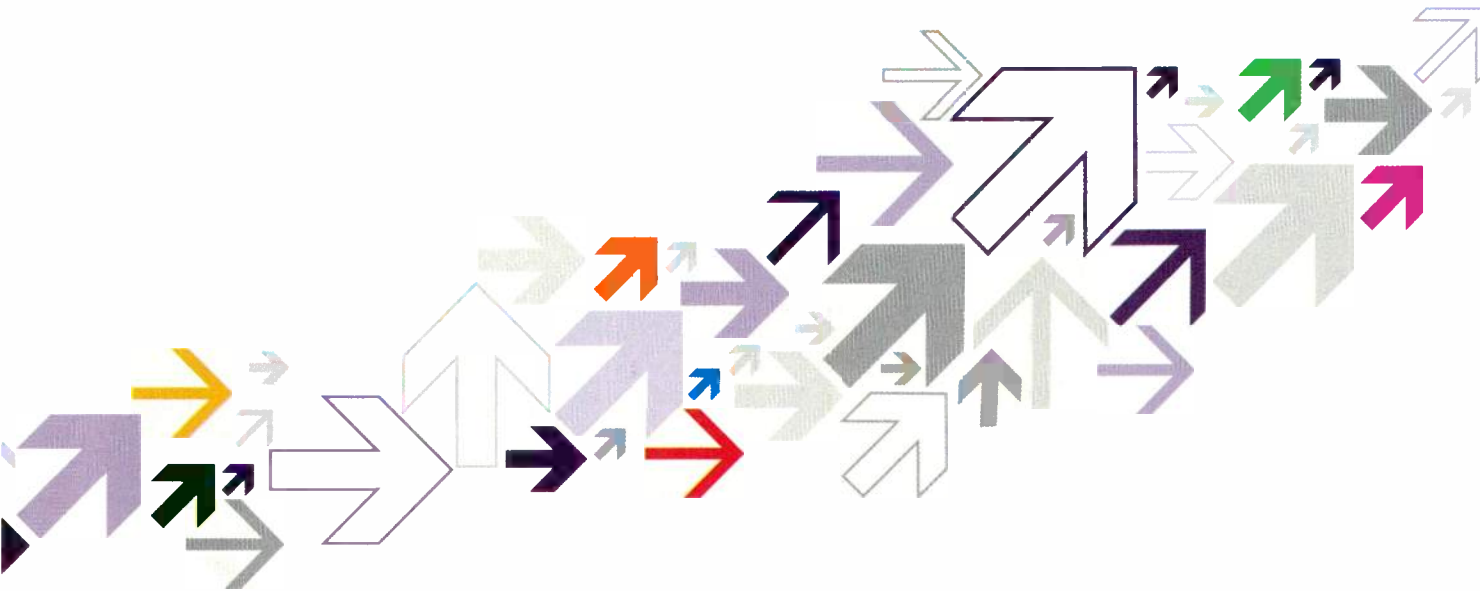
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Transitioning to IPv6

With IPv4 exhausted, now is the time to finalize plans for the change.

BY CIPRIAN POPOVICIU

Stop for a moment and try to estimate how many times during the past week you read, heard or spoke the words “video,” “cloud,” “mobility,” “smart grid” and “smart buildings.” These are just some of the information technology-enabled services that are changing the way we live, learn

and work. We are living in exciting times empowered by rapid innovation in information technologies, and the foundation of it all is the Internet Protocol (IP). Video, cloud, mobility and smart-grid services depend on IP, making the Internet Protocol-based infrastructures strategically important to any competitive business or

organization. Yet just as we started to scratch the surface of what is possible, IP ran out of resources, and ran out of IP addresses.

On Feb. 3, in a news conference organized by the Number Resource Organization (NRO), the official representative of the five Regional Internet Registries (RIRs), we learned that the free pool of IPv4 addresses was exhausted. Raúl Echeberria, chairman of NRO, described Feb. 3 as “a historic day in the history of the Internet, and one we have been anticipating for quite some time. The future of the Internet is in IPv6. All Internet stakeholders must now take definitive action to deploy IPv6.”

IPv6: the next generation of IP

Work on a solution to the IPv4 address exhaustion problem started in 1994. While the new protocol significantly increased the size of the IP address space, the Internet Engineering Task Force (IETF), the standardization body, took this opportunity to integrate the lessons learned from running IPv4 over all these years. At first sight, IPv6 is very similar to IPv4 even though the two protocols are not compatible. A closer look, however, will uncover important differences that go from design optimization to new architectural concepts. The implications of these differences must be understood within every aspect of an IT environment, from layer two to applications, from tools to operations.

The key takeaways from drawing a parallel between IPv4 and IPv6 are:

- *Similar but not the same.* There are many similarities between IPv4 and IPv6 so you can leverage your IP experience. However, the two protocols are not compatible. (See Figure 1.)

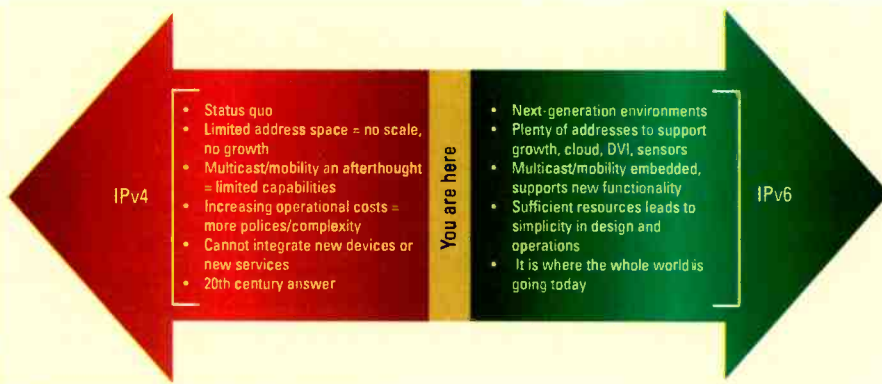
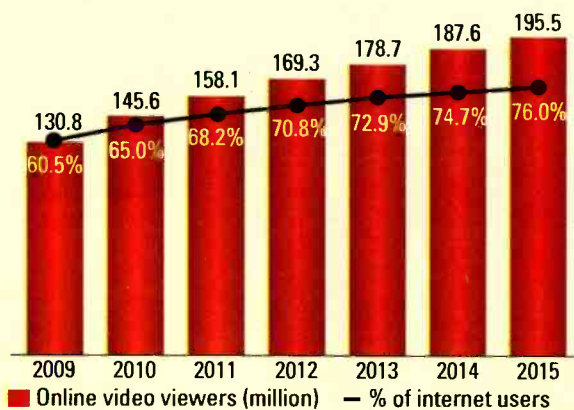


Figure 1: A comparison of IPv4 and IPv6

FRAME GRAB *A look at the issues driving today's technology*

Consumers' interest in watching video is growing exponentially

By 2015, 76 percent of U.S. Internet users, or 195.5 million people, will be watching video content online each month.



Note: Internet users who download or stream video online via any device at least once per month

Source: eMarketer

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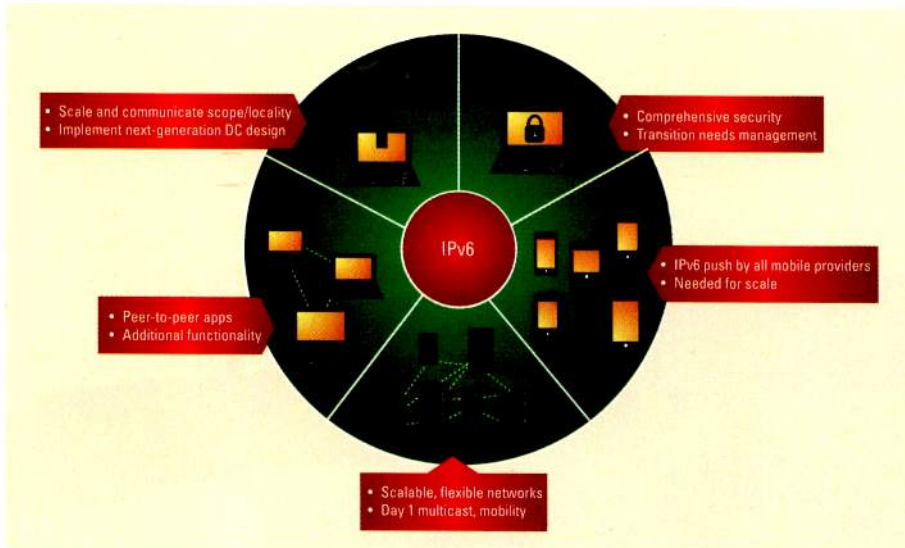
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The transition to IPv6 will be felt in most business sectors.

- **Bigger, better addresses.** The 128-bit IPv6 addresses deliver a significantly larger address space than IPv4's 32-bit addresses. At the same time, IPv6 architecture assigns scope to address providing new design, operations and troubleshooting options.
- **Product support for IPv6 is not a given.** Feature and performance parity between IPv4 and IPv6 support in products is still a work in progress. Moreover, IPv6 places new requirements on products, from hardware to software design.

Broadcast Engineering has been informing readers about the upcoming transition to IPv6 starting with the December 2008, overview of the protocol, "IPv6 is coming." In a July 2009 article, "Implementing IPv6," we covered the deployment aspects of this transition, particularly focusing on the implications to video content distribution services. This article builds on the previous two to help you plan for the transition.

IPv4 exhaustion and IPv6 transition

What does the Feb. 3 announcement mean to us? On Jan. 31, IANA assigned two /8 blocks to APNIC (the Asia Pacific RIR), which triggered a policy requiring IANA to distribute the remaining five /8 blocks to the RIRs. Each RIR has at a minimum a /8 left to assign to requestors.

Will there be a run on the bank?

The answer is no. Requesters will have to spend a lot more time and resources in justifying the need. Moreover, by policy, every request for IPv4 address space must also describe the requester's IPv6 adoption plans. In the end, however, depending on demand, the RIRs will exhaust their pools within weeks or a few months.

The transition to IPv6 is about scaling up and simplifying the design of our leading IT and service initiatives, it is about bringing more users and devices into the Internet fold, and last but not least, it is about building next-generation IP infrastructures. In summary, the transition to IPv6 is critical to maintaining the competitive advantage of your organization. In fact, market-leading, innovative companies have already committed to IPv6. The June 8 World IPv6 Day, organized by the Internet Society as a worldwide IPv6 interop, will be enabled by tech giants such as Google, Facebook, Yahoo and Akamai.

World IPv6 Day marks an irreversible trend towards the next phase of the Internet. The question is: When should I start the transition process? To take full advantage of the transition and to implement it with minimal costs and impact to productivity, you should start planning right away. A minimal investment in planning today would help achieve readiness at marginal cost through refresh cycles and inflight projects. Analyze the risks and plan to

take full advantage of the opportunity. Be prepared before your competition acts and your partners and customers demand IPv6 connectivity.

Preparing for the IPv6 transition

The sooner you start defining your IPv6 transition plans the better. First and foremost, make sure your staff gets the necessary training on IPv6. The transition is not one size fits all, so the best way to address the specifics of your environment is to have a knowledgeable staff involved in the planning process early on. Second, invest in a dedicated planning effort. An optimal transition requires a comprehensive approach to planning. Domain expertise must be combined with in-depth IPv6 knowledge and experience to define the target architecture, coordinate across organizations and initiatives, and to adjust policies and processes. Last, but not least, initiate a risk assessment effort that will include an analysis of the security threats prior to enabling IPv6. IPv6 is a ubiquitous technology that will touch all aspects of your organization.

IPv6 is not just about the risk of losing competitiveness, but also it is about the opportunity to leapfrog competition. IPv6 already changed the competitive landscape and several markets. It is thus imperative to take a strategic perspective on this transition. The next generation of your infrastructure will be running on IPv6, and this is the opportunity to map business priorities to infrastructure requirements and start planning for its implementation. At a minimum, consider the risk to your franchise if your website is not IPv6-reachable on June 8 while your competition's is.

IPv6 is the inflexion point that, along with cloud, mobility and applications, will shape the next generation of market leaders. Where do you stand with respect to IPv6? **BE**

Dr. Ciprian Popoviciu is the director of the infrastructure/cloud group at TechnoDyne.



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Spectrum grab

The wireless industry's raid on spectrum is about to materialize.

BY HARRY MARTIN

In February, CTIA—the Wireless Association (CTIA) and the Consumer Electronics Association (CEA) submitted a white paper to the FCC purporting to demonstrate that voluntary or incentive auctions of 120MHz of broadcast television's spectrum will produce more than \$33 billion in net proceeds for the U.S. Treasury. According to the accompanying press release, such an auction would “fulfill the vision of the FCC's National Broadband Plan.” Key findings from the paper include:

- The licenses auctioned in the broadcast TV band would produce net auction revenues of approximately \$33 billion or much higher if

valuations are consistent with recent auctions for similar spectrum.

- Only a small percentage of the nation's broadcast stations need participate in the auction in order to address the nation's broadband spectrum shortage. Indeed, in the vast majority of broadcast markets, an incentive auction will still be successful even if no broadcast stations participate. In a limited number of markets, the number of licensed broadcasters will exceed the channels that will remain available for TV use following a reallocation. As a result, a number of potential voluntary avenues to freeing additional channels have been proposed that rely on commercial incentives, including “paying” broadcasters to exit the market through an incentive-based auction mechanism, paying broadcasters to share channels, paying broadcasters to adopt a cellularized architecture and paying broadcasters to relocate to low VHF spectrum.

- The estimated enterprise value of those broadcast TV licensees that might voluntarily surrender their channels ranges from \$1.2 billion to \$2.3 billion assuming participating stations surrender their licenses rather than accept lower-cost options such as channel sharing or cellularization.

- Remaining broadcast facilities operating on TV channels 31-51 would need to be relocated or “repacked” to the new core channels at TV channels 7-30. Based on NTIA data, CTIA and CEA estimate repacking would cost approximately \$565 million.

- After deducting the costs of voluntary exits and repacking, the estimated net proceeds from auction of 120MHz of broadcast TV spectrum are \$33 billion. In light of spectrum valuations at recent FCC auctions, this number may be much higher. Furthermore, while

incumbent broadcasters may require a price over their market value to exit, the net revenues from a TV spectrum auction would still be considerable.

Broadcasters beware

CTIA and CEA contend that the wireless industry needs more spectrum to remain the world's wireless leader. In the joint press release, CEA's Gary Shapiro said, “The spectrum crisis is real and must be addressed to ensure that our innovation-driven economy can recover and thrive. Additional spectrum for licensed and unlicensed wireless broadband is crucial to our national competitiveness. A voluntary incentive auction will create jobs, enhance innovation, provide the government resources to reduce the national debt, and even give broadcasters a windfall of billions of dollars for spectrum they don't own. CEA and its members look forward to working closely with the FCC to ensure competitive broadband and innovative new wireless services are available to all Americans.”

TV broadcasters beware: The wireless industry's raid on spectrum as described above is about to materialize. Congress is actively considering legislation that would authorize incentive or voluntary FCC auctions in which television station owners could share in auction proceeds if they agree to give up all or part of their spectrum for wireless use. At least one version of the legislation includes value-based spectrum fees that would have the effect of forcing participation by financially-weak stations. **BE**

Harry C. Martin is a member of Fletcher, Heald and Hildreth, PLC.

? Send questions and comments to: harry.martin@penton.com

Dateline

- Noncommercial TV stations in Michigan and Ohio must file their biennial ownership reports on or before June 1, 2011.
- By June 1, TV and Class A TV stations in the following locations must place their 2011 EEO reports in their public files and post them on their websites: Arizona, D.C., Idaho, Maryland, Michigan, New Mexico, Nevada, Ohio, Utah, Virginia, West Virginia and Wyoming.
- The license renewal cycle begins June 1, 2012, for TV, Class A TV, TV translators and LPTV stations in D.C., Maryland, Virginia and West Virginia. In these states, on April 1, 2012, TV, Class A TV and LPTVs that originate programming must begin their pre-filing renewal announcements. The renewal cycle continues region by region until April 1, 2014, when stations in Delaware and Pennsylvania will be the last to file for renewal.



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MPEG standards

A new generation of standards provides more efficiency and higher quality.

BY ALDO CUGNINI

While you may have thought you were familiar with all the most relevant MPEG standards, such as MPEG-2 and MPEG-4, the MPEG committee has been busily developing a new set of international standards, called MPEG-A, MPEG-B and so forth. But, as opposed to developing new compression tools, most of these new standards package together multiple existing MPEG technologies that form a collective solution to a particular application. MPEG-A and the other derivative standards were formed to deliver normative specifications to achieve interoperability of applications and present opportunities to use the standards in ways not originally foreseen.

Historically, MPEG has supported wide-ranging solutions by defining

profiles. A profile in MPEG represents a subset of tools from a part of an MPEG standard (a subset of the syntax), in order to arrive at a trade-off in terms of functionality and

complexity, for relevant classes of applications. Thus, while each numbered MPEG standard uses various profiles that, taken together, form a video codec with particular features,

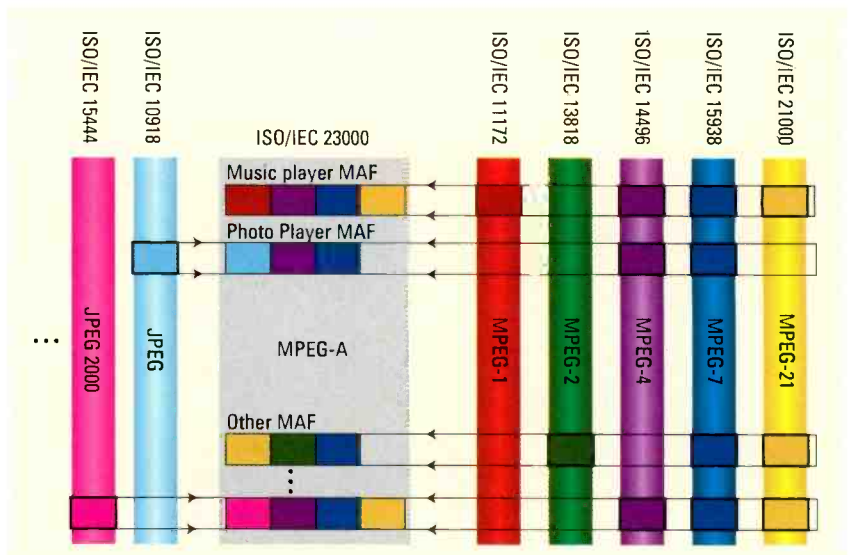


Figure 1. MPEG-A uses elements from various other standards.

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the new lettered standards group together different technologies that can be used for different applications. In fact, in an effort to make MPEG truly universal, some of these technologies even come from outside the existing realm of MPEG standards. This practice of combining technologies from different standards already exists in many applications, including ATSC and DVD.

MPEG-A

MPEG-A is the Multimedia Application Format (MAF) that describes a number of applications, such as the Professional Archival Application Format. As an example, consider the MPEG-A Music Player MAF and Photo Player MAF, shown in Figure 1. Not only do these specifications



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include elements from a number of MPEG standards, but elements of other standards, such as JPEG, are referenced as well.

The MPEG committee expects that new Application Formats can continually be developed and added to the standards, keeping them current with new technologies. A great value of this process is that the work needed to develop and validate new products and services can be reduced significantly, since the MPEG "letter" standards will come with reference software implementations that can be used for the rapid development of corresponding products and services.

MPEG-B

MPEG-B systems technologies define a number of coding tools, including Reconfigurable Video Coding (RVC), binary MPEG format

for XML, Bitstream Syntax Description Language (BSDL) and Dynamic Adaptive Streaming over HTTP (DASH). MPEG-B RVC includes two standards, Codec Configuration Representation and Video Tool Library,

RVC provides advantages for semi-custom silicon development.

completed in 2009. The Video Tool Library specifies a set of Functional Units (FUs) that describe video decoder processes such as block transforms, motion compensation and entropy decoding.

A Decoder Description Language (DDL) further defines the structure

of a video decoder, and the format of the coded bit stream is defined using Bitstream Syntax Description Language (BSDL), both specified in the Codec Configuration Representation standard. In effect, RVC not only allows the design of codecs with different building blocks, but also it allows the interconnections of the blocks to be arbitrarily specified.

With this reconfiguration flexibility, one might be tempted to believe that a decoder realized completely in software could be more versatile than a hardware decoder. While such an implementation may offer value to PCs and similar devices, dedicated silicon (or high-speed signal processors) very often provides a more effective solution because permanent low-level structures can often be optimized better. Nevertheless, RVC does provide advantages for semi-custom silicon development, such as for Field-Programmable Gate Arrays (FPGAs), which are readily and inexpensively developed using RVC tools.

MPEG-C

MPEG-C (2006) covers various elements, including an accuracy specification for implementation of integer-output inverse discrete cosine transforms, and application requirements for stereoscopic video (SSV). The first, while sounding technically ominous, is simply a way of providing a known quality bound for block-based transform coding. Recall that the DCT is one of the elementary tools used in the most common video compression codecs, and a higher level of image fidelity (fewer block artifacts) can now be achieved when the accuracy of the DCT-inverse-DCT cascade (such as used in the coding-decoding process) is compliant with this specification.

Of perhaps greater interest to prospective MPEG-C end users is the new SSV specification. To maximize interoperability between content providers, broadcasters and display manufacturers, MPEG-C SSV defines a standard format for compressing

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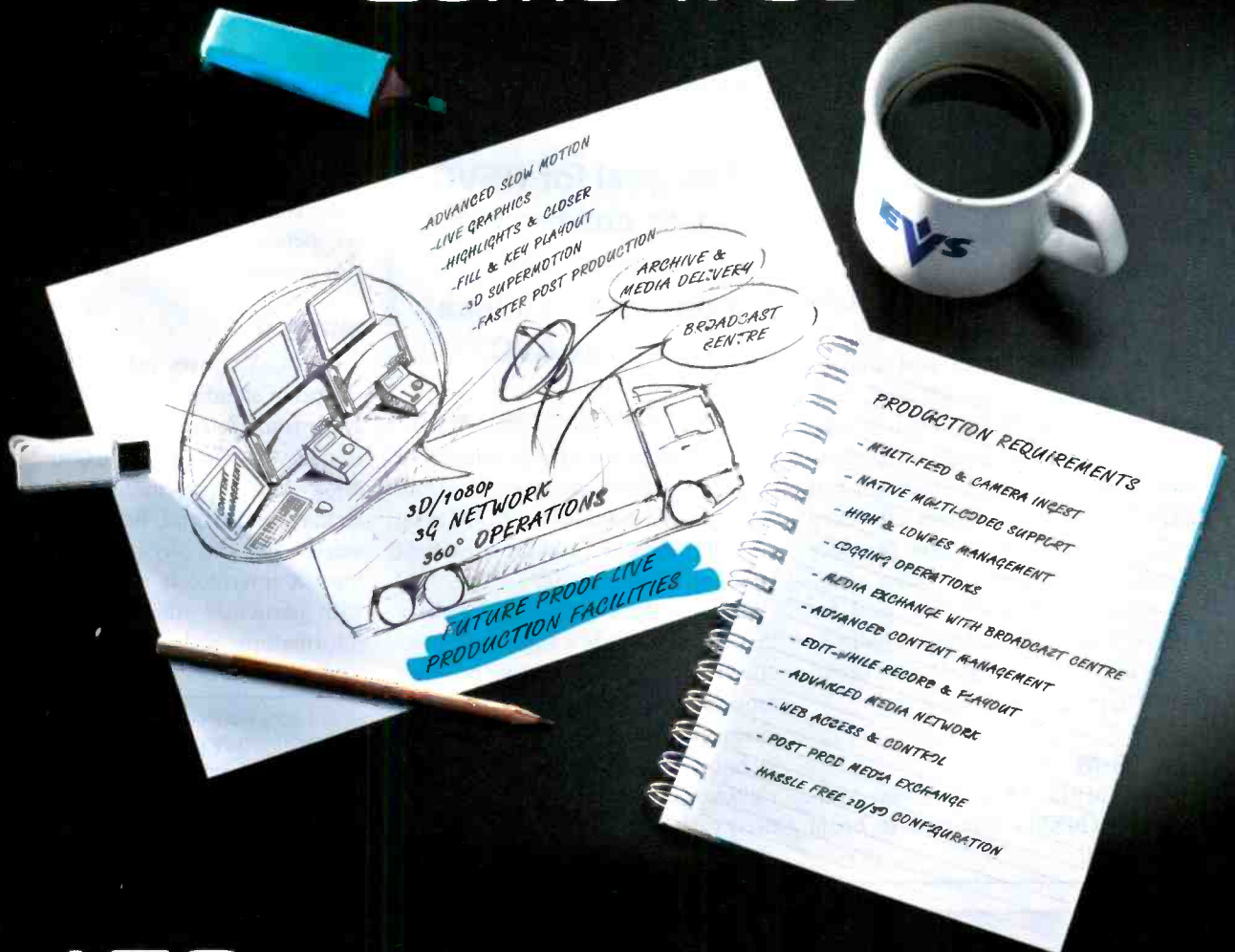


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2D+depth video. Applications requiring the encoding of depth maps are supported by corresponding requirements, and mobile displays are also considered. Features of the specification include low overhead, backward compatibility with and re-use of existing MPEG and other standards (including MPEG-2 and AVC), flexibility with respect to compression scheme, timely availability, simplicity, and display independence.

MPEG-D, MPEG-E and MPEG-H

MPEG-D covers various audio technologies, including surround sound, spatial coding and unified speech/audio coding. MPEG-E is a new standard (M3W) providing support for the download and execution of multimedia applications, and MPEG-H is the new high-efficiency video codec (HEVC) that provides significantly increased video compression performance. The goal for HEVC is to cut the bit rate in half relative to codecs such as AVC. A broad set of applications is targeted.

MPEG-M

The MPEG-M eXtensible Middleware (MXM) standard is being

developed to promote the extended use of digital media content, facilitating the production of multimedia applications and devices. MXM provides a standard specification for middleware architectures and technologies, middleware APIs (application programming interfaces) and inter-middleware protocols. While this

The goal for HEVC is to cut the bit rate in half relative to codecs such as AVC.

has been done in arenas outside of MPEG, e.g., the open-source Android platform, the emphasis of MXM is on audio-video media and the consistent handling of that media.

The developers of MXM believe that it can provide a rapid and cost-effective path to innovative business models because all parts of the value chain are based on the same set of technologies. Although this sounds rigid and all-encompassing, MPEG-M users can pick and choose the parts of

the MXM standard that are relevant to their particular application. (Think *profiles*, again.)

MPEG-U


The MPEG-U Rich Media User Interface is a specification that provides a standard protocol to build user interfaces, including widgets, and the interfaces between widgets and widget managers. One benefit of this standard is the interoperability of widgets from different service providers; personalized user interfaces are also possible.

MPEG-V


MPEG-V closes out the new alphabet of standards, defining formats and protocols for "Information Exchange with Virtual Worlds," and covering data representations between virtual worlds and between virtual worlds and the physical world. The human interface is also considered, with particular attention to sensory information and data formats for interaction devices. **BE**

Aldo Cugnini is a consultant in the digital television industry.

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Core network protocols

Understanding the core protocols running on your media networks helps you manage your facility.

BY BRAD GILMER

As a younger person, I thought I knew everything — especially about what appeared to be simple technical topics. But as the old adage goes, the older I get, the less I understand. This month we will look at the core protocols that enable your media network, or for that matter, any network. You may find that there is more going on than you thought.

Internet Protocol (IP)

When it comes to core protocols, it would be hard to argue against Internet Protocol (IP) being at the top of the list. We all know that everything these days travels over IP networks, but what is Internet Protocol exactly?

To answer that, we first should describe what a protocol is.

Long before there were computer networks, protocols described formal agreements between two parties about how they should interact. Protocols were often employed in affairs of state — interactions between nations. It is not too hard to see how agreements between computer systems about how they should interact got the name “protocols.” Protocols describe the expected messages and allowed responses on a computer network.

IP’s job is to put information in a header, which allows data to be routed from one device to another. IP is low on the protocol stack, so it

is closely related to the physical and electrical media that will be used to carry the data. IP prepares data sent to it by higher protocols for transmission across a network, taking into account things such as the packet length, hardware addressing structure and how data should be split across multiple packets (if this is allowed). IP addresses can be assigned by a network administrator, and this allows that administrator to group computers together and place them all on the same network.

These days, Ethernet is the dominant electrical and physical networking technology, especially in the broadcast environment, but remember that datagrams sent to you across

Protocol	Use
HTTP(S) Hypertext Transfer Protocol (Secure)	Used primarily by Web browsers, but increasingly used for the transmission and retrieval of files and other data. HTTPS encrypts data between the server and client.
IGMP Internet Group Management Protocol	IGMP is the core multicasting protocol. It allows a single host to send out messages to multiple clients. This protocol is used to send one stream to many receivers.
POP Post Office Protocol	Used to check and retrieve mail on remote mail servers.
SMTP Simple Mail Transfer Protocol	Used to send mail through a mail server.
SNMP Simple Network Monitoring Protocol	Used to remotely monitor equipment on a network. May also be used to execute limited remote commands.
SSH Secure Shell	Secure terminal emulation for use between clients (usually system administrators) and Internet servers.
Telnet	A nonsecure terminal emulation protocol for use between clients (usually system administrators) and Internet servers.

Table 1. This table lists a number of Internet core protocols that could not be covered extensively in this article.

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the Internet may be moved using wire, optical fiber, satellite and wireless. The specifics of these physical mediums are standardized at a lower level. The IP header contains 13 different fields. Two very important ones are the IP source address and the IP destination address. IP addresses allow datagrams to be routed automatically from sender to receiver across different physical networks. But how does that work exactly?

Address Resolution Protocol (ARP)

ARP allows network devices to associate a particular IP address (192.168.30.20, for example) with a specific piece of hardware. Behind the scenes, routers build ARP tables that contain the IP address of a device and the hardware address of the device. For Ethernet networks, the hardware address is known as the Media Access Control (MAC) address. While IP addresses can be assigned by anyone, MAC addresses are assigned by the equipment manufacturer and are unique for the device. Once the router associates an IP address with the unique hardware address, it can transfer the data to the correct device. You might ask: Why have two addresses? The answer is because not all IP networks are Ethernet networks. For example, you can run IP over Synchronous Optical Networks (SONET) or Token Ring. The identity of physical devices on SONET or Token Ring networks are established with other mechanisms. This allows us to deliver the same IP datagrams to the end user regardless of whether the datagrams travel over different physical networks.

Ports and port numbers

Port numbers are used in several protocols, but perhaps most importantly in Transport Control Protocol (TCP) and User Datagram Protocol (UDP). The concept of port numbers originates from the time when mainframe computers were physically wired to terminal devices such

as teletype machines. (We are talking about a long time ago.) The physical connections to the main frame were called ports (thus TTY0, TTY1, etc. still found in Unix today). IP addresses allow you to send data from one computer to another.

But once a packet is delivered from source to destination, how does the destination computer know what to do with it? It could open the packet to examine the contents, but a better way might be to add a tag that tells the computer what it is. You may have heard that HTTP (Hypertext

ARP allows network devices to associate a particular IP address with a specific piece of hardware.

Transfer Protocol) is normally on port 80. What this means is that HTTP packets are marked as going to port 80 so that the receiving computer can automatically route those packets to a Web browser listening on that port. But how do you get the port number into the packet?

Transmission Control Protocol (TCP)

TCP is used to collect data from an application, perhaps a Web server, and to send that data to a Web browser at the other end. The TCP header contains a source and destination port number field that allows the application to mark the datagram appropriately. But TCP provides another vital function: TCP attempts to guarantee delivery of the datagram. TCP does this by stamping each datagram with a unique sequence number. It then looks for the receiver to acknowledge that it received the datagram. If the receiver takes too long to respond, or if the receiver asks, the sender will resend the dropped packet. TCP also implements

a number of rate-control mechanisms to deal with rate limits imposed by the receiver and to deal with congestion issues on the network.

TCP does one other nifty thing besides handling lost packets. It reorders packets that have been received out of sequence. Once a packet is launched onto the Internet, it is on its own, and there is no association between this packet and the one that comes before or after it. Packets can and do arrive in a different order from the order in which they were sent.

TCP is extremely common, and it almost always runs on top of IP, so the notation TCP/IP is common. But bear in mind that TCP/IP specifies two separate protocols: TCP and IP.

User Datagram Protocol (UDP)

UDP operates at the same level as TCP and provides the same basic functionality. As with TCP, UDP collects data from an application and directs it to a particular port on a destination device. But UDP is a much lighter weight protocol. UDP simply collects the data from the application above, stamps it with a source and destination port number, and sends the datagram on its way. Nothing in the UDP protocol guarantees that packets sent across the network will reach the receiver. In fact, UDP explicitly does not check to see that packets have been received. UDP is a "fire and forget" protocol.

UDP is often employed in professional video-over-IP contribution devices. UDP's light weight is a benefit when dealing with the high bit rates required for live video transmission. Also, with professional video, requesting a retransmission of lost packets may not be practical. By the time the whole retransmission process completes, the time for the video to be displayed may have passed.

UDP packet sizes can vary, and in some cases UDP packets can be very large. This brings up the issue of fairness. Very large UDP packets may hog bandwidth on a network, causing

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other traffic to suffer. For this reason, and for other security reasons, some system administrators do not permit UDP traffic to cross their firewalls. This can cause headaches for broadcasters who are using UDP for backhaul transport.

File Transfer Protocol (FTP)

As the name implies, FTP is used to transfer files across the Internet. FTP has some excellent features that make it an indispensable protocol. FTP handles lost packets and reordering. It also senses congestion on a link and employs automatic rate control to relieve the congestion.

That said, FTP has some characteristics that make it unsuitable for moving professional video files. First, many FTP applications have a file size limit of 2GB. Professional video files can be much larger than this, so this limitation can be a real problem.

Second, FTP has rate-control mechanisms that can interfere with transmission of large files. If FTP senses that the network is congested, it responds by cutting its speed in half. If the congestion continues, FTP cuts

FTP senses congestion on a link and employs automatic rate control to relieve the congestion.

its speed in half again. This continues until the transfer either succeeds at a lower rate or aborts due to timeout. If the session has not timed out and the congestion situation improves, FTP increases its speed, but it can take a long time (several tens of seconds)

for FTP to get back to its initial speed. You can see this rate reduction on a network traffic monitor as a stair-step pattern. Unfortunately, in some cases, FTP's rate control mechanisms can limit throughput to a low level even though the available bandwidth is high and congestion does not exist.

There are a number of other protocols that are critical to network operations. See Table 1 on page 24 for a quick summary. Also, I strongly recommend that you read "Internet Core Protocols" by Eric A. Hall (O'Reilly). This excellent book will give you much more detail on these protocols. **BE**

Brad Gilmer is president of Gilmer & Associates, executive director of the Advanced Media Workflow Association and executive director of the Video Services Forum.

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File-based workflow

Such a workflow can save newsrooms money while delivering more and richer content.

BY FRED FOURCHER

New video-enabled devices have changed the way viewers consume news. Few broadcasters would deny the significance of these devices. Yet because 90 percent of television station revenue comes from the core business of broadcasting, taking care of the core is what receives 90 percent of most broadcasters' attention. Many stations are potentially leaving significant money on the table.

Instead, what if these video-enabled devices and Internet-connected TVs were actually additive to your audience? What if these devices enabled

A better way

Let's look at this situation differently. Knowing that today a station must feed many platforms besides the 5 p.m. newscast, suppose we start with a completely clean slate. Such a solution might employ a quite different news production process. The end game in news has not changed. Because stories must still get to air as fast as possible, any new solution must satisfy all of the new distribution platforms simultaneously.

Instead of waiting until the 5 p.m. or 6 p.m. newscasts to break a story, a station might choose to put stories

How can a station operate on a virtually constant deadline?

Changing the staff's tools is not the only way to upgrade a station's news-gathering capabilities. Take a big-picture approach. It's the overall system that should conform to the station's workflow, not the other way around. Technical issues, such as competing compression formats, multiple delivery channels and screen sizes, should not slow down the acquisition, production and dissemination of news.

Simplify the process

Current production processes are legacy, left over from the days of tape and even film. A modern, file-based workflow can eliminate many needless production steps, saving many hours of overhead. An effective file-based workflow means everyone benefits from increased productivity. One example of a file-based newsroom workflow is shown in Figure 1.

Just adding new production tools such as cameras and NLEs may not necessarily provide the efficiencies required to meet the increased demand of new channels. They are only one part of the overall process. Begin the redesign process by looking at the raw materials (files, live feeds, viewer video, etc.) on one side and the finished goods (news delivered to any platform when it happens) on the other. Once the origination and distribution processes are established, then what must be done in the middle becomes more clear.

The solution is a simplified version of the traditional news production system, one that allows the news staff to handle disparate materials and funnel them into a single pipeline that fully addresses all of the various delivery platforms.

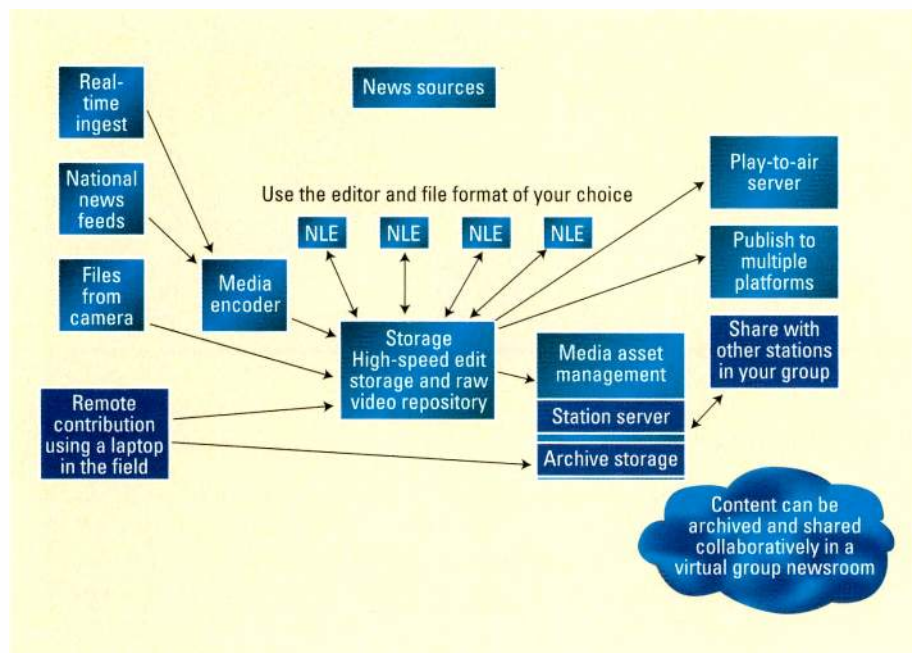


Figure 1. Shown here is an example of a file-based newsroom workflow.

a station to reach viewers never before reached? And, what if the potential for new revenue represented far more than just 10 percent of business? The question then becomes: How much will it cost to address this new growing audience?

online as they happen. This concept considers that most online and mobile viewers are not on-air viewers. Allowing this audience to view the news on their platform of choice does not detract from a station's on-air ratings. The challenge then becomes:

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Any solution should be non-proprietary, offering an end-to-end file-based workflow. The result should provide play-to-air automation, news management, multiple-channel distribution and archiving — all without significantly increasing staff workload.

No barriers

Ingest must be simple and easy to use. It should be browser-based in order to facilitate the use of a myriad of interfaces and to provide access to stored media from both inside and outside the station. Basically, the system should be a seamless part of the station's IT infrastructure, not a foreign island that needs special care and attention.

A next-generation news production platform should be based on high-quality servers, like those available from trusted business computer companies that use a standard OS. This makes them easier and less costly to maintain and upgrade. Such servers tend to work seamlessly with existing IT infrastructure.

A next-generation newsroom system should include media asset management functions to enable easy and fast access to all current and archived news. This allows editors and promotions staff to quickly find clips and access media instantly. The value of online assets is often overlooked because in the tape-based world, it is too costly to retrieve. However, an integrated file-based archive system allows producers to easily find and use historical footage.

The need to share

On the delivery side, any next-generation news production platform should allow content to be easily shared within a group, further increasing a local station's ability to provide viewers with unique stories. This enables a wide-area production environment, branded locally, but done so with a minimum of local labor. To accomplish this, stations within a particular group can either use the same production platform or

rely on a system that bridges different platforms into one non-proprietary sharing system.

For instance, you cannot see an FTP. So a production system that automatically allows staff to view all the assets across a whole group is an important tool. Also, by incorporating wide-area acceleration technology, file transfers occur two to three times faster than with FTP.

Road map for success

With good planning, training and a flexible technology platform, stations can not only produce content more efficiently, but also they can disseminate news anytime, anywhere.

To meet this challenge, newsrooms should:

- Use an open and standard IT-centric model, which helps reduce proprietary roadblocks and bottlenecks.
- Embrace a file-based workflow starting with field-based laptop editing and remote contribution.
- Cut the story once with multiple versions to satisfy the needs of each newscast and all other platforms.
- Use browser-based, ubiquitous online asset management and archives for universal access to all media both in the station and across the group.

The decision to move to a file-based workflow should not be done just to save money, but rather to improve overall workflow, efficiency and add distribution options. Properly designed, such a solution can save money while delivering more and richer content, which is something stations can monetize. And for most operations managers, chief engineers and news directors, that's the Holy Grail.

BE

Fred Fourcher is president and CEO of Bitcentral.

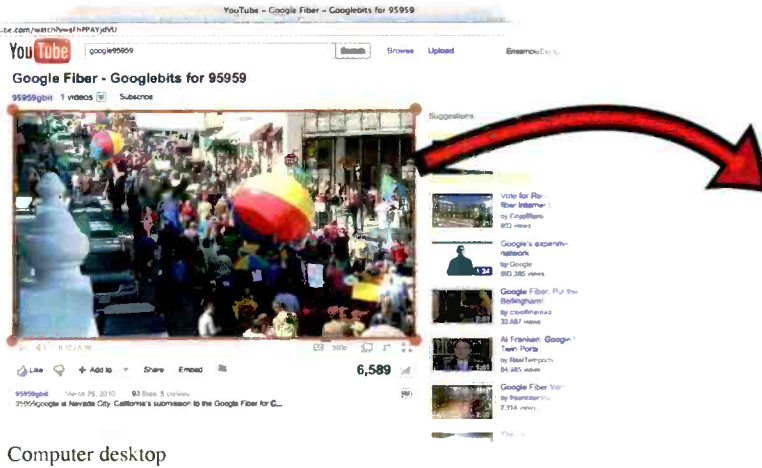
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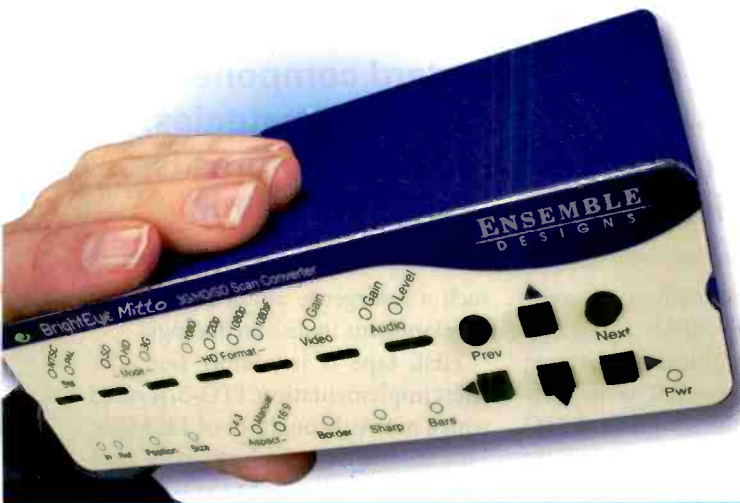
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Tale of the tape

Data tape's role in the digital media workflow is growing.

BY PETER HALPERN

The digital media market is currently experiencing the largest explosion in data growth the world has ever seen. Technological advancements and increased demand for HD and 3-D content have created exponential storage requirements for content creators, owners, producers and distributors. With this exponential growth comes the inevitable challenge of effectively storing large amounts of data while still maintaining production efficiency.

There has been an aggressive argument made over the past several years, albeit mainly promulgated by disk vendors, that all storage — including archival — should be managed by using disk as the primary storage medium. Despite this dubious but loudly proclaimed view, an increasing number of organizations are opting to purchase data tape to effectively achieve their storage goals. This reality was further validated by an IDC report that estimated that there are approximately 160EB of digital data in existence, with about 1.2ZB expected by the end of 2010, and as of today, about 80 percent of that digital content resides on data tape⁽¹⁾. So that begs the question: Which should an organization choose, disk or tape? The answer is both.

Although disk is a standard component of most backup and archiving strategies, the push for “disk-only” architectures is experiencing increasing opposition. A recent study, conducted by the Fleishman-Hillard Research for The Linear Tape Open (LTO) Program, showed that the number of companies deploying a disk-only storage strategy in their environments declined by a surprising 13 percent last year. The study also found that 58 percent of the companies still using a disk-only strategy currently have



With the growing demand for HD and 3-D content, storage requirements have been on the minds of many content creators, owners, producers and distributors. Many are re-examining the benefits of tape-based archives.

plans in place to reintroduce tape for interim storage, and an even greater number, 68 percent, plan to at least reintroduce tape for long-term archival and retention purposes⁽²⁾.

The prominent tape format used today is Linear Tape Open (LTO). LTO was developed and is currently

security to buyers because they know that they are not dependent on just one manufacturer.

LTO is a format that users can trust — the format now has a published roadmap through LTO-8⁽³⁾. So, other than the widespread adoption of the LTO format, why is tape seeing

Although disk is a standard component of most backup and archiving strategies, the push for “disk-only” architectures is experiencing increasing opposition.

managed by a consortium of companies, including IBM, HP and Quantum, with significant input from other companies as well. The open architecture makes the adoption of LTO more appealing to organizations as compared with the proprietary tape formats offered by some vendors. The open format allows multiple vendors to manufacture both the tape media and drives, which helps drive costs down through competition. This also provides a heightened sense of

such a resurgence amidst continuing developments in disk technology?

First, tape is incredibly fast. The latest implementation, LTO-5, is rated with a native throughput of 140MB/s. This means that a robotic data tape system containing eight LTO-5 drives can read and write data at well over a rate of 1GB/s, which is significantly faster than most disk systems on the market today. For a real world example, let's say a post facility or a television station tries to pull a 20GB file

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from an LTO-5 tape, and assuming the other variables in that environment can support the max throughput of the drive at 140MB/s, then that user will be able to retrieve the file in about five minutes. For most environments, this five-minute retrieval time is more than adequate.

Secondly, tape is extremely reliable. Perhaps equally as important as the read/write speed, users have confidence that they'll be able to retrieve files when needed. Recent research has proved that the inherent reliability of tape has increased by more than 700 percent in the past decade⁽⁴⁾.

Additionally, the myriad of recent advancements made to both the robotic tape library systems and tape results in an exponential increase in system reliability. Today, most mechanical parts used in tape libraries are considered off-the-shelf-components, so the bulk of the R&D expenditures made by these companies go toward software development. This makes the systems more intelligent by enabling them to proactively monitor both hardware components and individual tapes, and therefore allows users to identify a potentially problematic piece of media before it results in an actual failure.

The final and perhaps most significant reason for tape's current resurgence is its low cost. According to a study by the Clipper Group, tape can be up to six times more affordable to acquire, and up to 27 times more affordable to operate than disk storage options⁽⁵⁾. The two may be somewhat comparable when looking solely at acquisition cost, but once operational costs are taken into consideration, the discrepancies become obvious.

In the Clipper analysis, the electrical cost associated with storing 1PB of data over five years on disk amounts

to \$670,009 versus \$25,873 for tape. And that's just electricity. Requirements for floor space, scaling, management and technological lifespan also drive up the operational costs for disk use while the operational costs for tape use remain low.

Workflow benefits

Now that we have examined the reasons why tape is assuming a growing role in digital storage strategies, it is equally important to recognize how disk is also necessary to create an efficient digital media workflow. The right balance of tape and disk use

Classify content based on time-to-access value, as well as by volume storage costs, including operational considerations.

varies depending on the specific environment. It is essential for an organization to assess the value of a given file at various points in time to determine its ideal storage home.

For example, in a TV news environment, files are most valuable to the organization within about two weeks of first airing. Because a big story can break at any time, it's imperative that a stored file can be accessed as quickly as possible, and even if it's just a couple of minutes faster to retrieve from disk, that two minutes can mean more revenue to your organization. The biggest difference in speed is due to the random access nature of disk; because it takes a certain amount of time for a

tape system to receive a command, retrieve the tape, load that tape into the drive, and find the first bit of information, it would not make sense to move these files immediately to tape.

Conversely, there are some scenarios where it is valuable to store large amounts of material on disk as well. For example, disk is the necessary storage medium for projects that are being actively worked. If you have numerous editors working on many stories or projects simultaneously, the amount of disk needed in that environment will be larger than one with only a couple editors and fewer projects. An organization must classify content based on time-to-access value, as well as by volume storage costs, including operational considerations. Once these decisions have been made, a storage management application can be programmed to handle the transfer of any file from one storage tier to the next with virtually no user intervention.

As we move from terabytes and petabytes of content into a world of exabytes and zettabytes, it is clear that transitioning to a disk-only infrastructure makes less economic sense than previously imagined. Savvy, cost-efficient organizations are recognizing the benefits of tape and re-examining its modern role in the digital media workflow.

So, why tape? The answer is simple. Tape technologies have advanced significantly over the past decade, equaling or surpassing many of the advantages normally attributed to disk, while retaining the considerable cost advantages of tape. The real trick, however, is finding the right balance of both disk and tape to build an optimal digital storage infrastructure.

BE

Peter Halpern is a media and entertainment market specialist at Spectra Logic.

Footnotes:

1. *The Expanding Digital Universe: A Forecast of Worldwide Information Growth Through 2010*
2. Fleishman-Hillard Research for the Linear Tape Open (LTO) Program
3. lto.org/media4.html
4. Mesabi Group, *Infostor Magazine*, "Sense and Sensibility About Tape and Disk," Dec. 2008
5. Clipper Analysis, 2008

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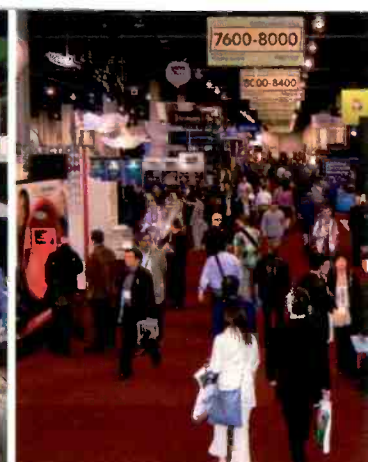
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Next, in addition to the 150 new products announced in our March issue, this month we're happy to present another 200 products that will be introduced at NAB. Whatever you need, you'll find it here.

Happy travels, and we'll see you on the show floor!

View from the top

40

Product exposition

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Mobile TV — new opportunities

SCOTT BARELLA, VP OF TECHNOLOGY AND BUSINESS DEVELOPMENT, LARCAN

While he hasn't yet seen a stampede of broadcasters to launch Mobile DTV service, Scott Barella, VP of technology and business development at Larcan, says several interlocking technical issues related to the new service will be widely discussed at the NAB Show. Among the most important will be the relationship between quality of service delivered and the revenue model employed for Mobile DTV; power efficiency; the future of main antenna versus distributed transmission via a single-frequency network (SFN); and a growing chorus of broadcasters who will question the fairness of being forced by the government to restrict Mobile DTV modulation to ATSC A/153.

To Barella, the quality of service broadcasters seek to achieve with Mobile DTV will depend on how important it is to them that they protect the content they are delivering.

"Subscription, advertising or a combination of both will determine the mechanism of capital expenditure for RF when it comes to mobile," he said.

Mobile DTV deployment based on a subscription model may require broadcasters to add a higher level of RF redundancy.

But quality of service issues don't end with redundancy, he said. Ultimately, broadcasters may need to consider deploying SFNs to augment their current antenna. As they do, Barella said, they likely will explore whether it makes sense to reduce power out of their main antenna in favor of powering up a network of low-power transmitters in an SFN.

While these issues will be front of mind, they likely will be overshadowed by the bigger concerns raised by the FCC's National Broadband Plan and its implications for Mobile DTV, Barella said. Increasingly, broadcasters will ask why they are being asked to relinquish spectrum rather than being given the freedom to employ other modulation techniques such as CMMB or DVB-T2, which could position them to deliver free-to-air TV and meet the goals laid out in the National Broadband Plan, he said.

By Phil Kurz, "HD technology Update" newsletter writer



Keeping the industry CALM

TIM CARROLL, PRESIDENT, LINEAR ACOUSTIC

The biggest challenge facing broadcasters isn't the economy, according to Tim Carroll, president of Linear Acoustic; it is understanding how best to implement the appropriate technology to guarantee compliance with the CALM (Commercial Advertisement Loudness Mitigation) Act.

The new law has stimulated broadcasters to implement the necessary technology — including systems that feature loudness control, embedded HD-SDI audio, built-in Dolby AC-3 encoding, dual upmixing and metadata management, as well as full-time two-channel downmixing to support legacy stereo or analog paths — and Carroll now sees a "palpable re-focus of attention" on the audio distribution process and ensuring audio level consistency.

Carroll, who is actively involved in the development of standards within the ATSC and other international standards groups, said the balance between real-time and file-based loudness control systems seems to be evening out. This is good for controlling loudness and ensuring high audio quality. Broadcasters are getting more serious about metering and attempting to pre-correct signal level problems where necessary.

To help with the transition to CALM-compliant systems, Linear Acoustic has a team of field application engineers who support broadcasters and systems integrators both remotely and on-site. Carroll sees consultation as a critically important part of the process for the customer and a valuable learning experience for everyone involved.

Going into this year's NAB, Carroll said he thinks broadcasters are ready to invest in technology that they needed a few years ago but held off due to the poor economy. However, this two-year spending hiatus has been beneficial because it has allowed audio metering and analysis technologies to become more refined and, in some cases, more compact and less expensive. This, plus the very serious attention being paid to the CALM Act, is helping stations (and others) move to the next level of broadcast audio operations and ensuring that consumers get a good television experience.

By Michael Grotticelli, "Beyond the Headlines" newsletter writer



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Future looks bright

GRANT PETTY, CEO, BLACKMAGIC

Grant Petty, CEO of Blackmagic, has rather different views from those who fear the impact of the Internet on future of broadcasting.

“I don’t think the broadcasters have many challenges,” he said.

Petty views online as a complement to broadcast.

“Music file-sharing has not affected radio,” Petty said. “The Internet doesn’t replace live television.”

Petty believes that broadcasters will focus more on local content mixed with the usual worldwide syndicated programming that they can get from other sources.

“There will be changes, with more focus on local content and local communities,” he said. “Live production will be a growing market to serve this local market. You have worldwide localization; a U.S.-based network is still local in the global context.”

Petty continued, “I think broadcasters worry too much. The technical challenge is to serve the global viewers with the local community news, encoding the station output for the Internet. The broadcaster becomes the community center, so even if you are travelling, you can watch your local news and events. People even look up the weather back home. The challenge is to encode all the different formats to consumer devices, rather than just pumping one signal to the transmitter. You need to be on both.”

Petty noted that the computer industry is solving the delivery problems, leaving broadcasters to focus on creating and encoding the content.



By David Austerberry, editor, Broadcast Engineering world edition

Integrated production is more than about cost

KEN SWANTON, PRESIDENT, BROADCAST PIX

Fully integrated production systems that allow one or two people to run an entire newscast or sports show are becoming increasingly commonplace, but not for the reasons you might think. Ken Swanton, president of Broadcast Pix, said that the cost savings are certainly an initial attraction.

But, “We’re seeing production staff at places like Turner Broadcasting, in Atlanta, asking for more control over the various separate devices needed to create a sophisticated multi-camera TV show,” he said.

The days of big budgets and even bigger production environments are slowly giving way to systems and workflows that allow broadcasters to adapt and change course quickly. It’s also a reflection of the need among broadcasters to serve more distribution platforms — TV, Internet and mobile — than ever before.

Swanton said that production professionals in the control room also want to take advantage of the file-based workflow their editing counterparts now enjoy, so the traditional production switcher now has to do so much more than it ever could. Leveraging computer-centric folders enables a graphics generator or clip store to accept files from anyone on a network and quickly bring them to air.

There’s also something to be said for the space savings that come with a system that builds all of the functionality needed for a full production into a single mainframe. Swanton said this translates to lower real estate and cooling requirements, and a production control room can be established virtually anywhere.

Perhaps more important than saving money or reducing staff, broadcasters want the most operational value they can get out of every piece of technology they buy, Swanton said. Even as the economy begins to improve, this price-performance proposition will not change.



By Michael Grotticelli, “Beyond the Headlines” newsletter writer

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Expect new IP audio standards

RUSTY WAITE, PRESIDENT, STAGETEC USA

Rusty Waite, president of STAGETEC USA, sees the migration to fiber as an important technology trend that, properly approached, will handle today's massive 5.1 channel counts while streamlining workflow and connectivity.

In terms of infrastructure, he sees a growing need for a complete networked system, with IP audio the logical choice to transport all those signals.

"Moving multichannel signals over a standard IP network is ideal. There are a lot of advantages to it, and it's something we can do today," he said. "The problem is that every manufacturer is running a proprietary protocol. To do that efficiently, especially over long distances and at live events, is to have an open standard protocol."

Waite pointed to Audio Video Bridging (AVB) as a promising open standard IP networking protocol, currently being developed by the IEEE 802.1 Task Group.

Waite sees some changes coming to the control surface as well.

"Audio operators are under immense pressure, working with multiple sources that are in 5.1 that need to be accessed and manipulated," he said. "Where we used to say 'one knob per function,' the truth of the matter is that 'one knob per critical function' is the new reality."

That means more and larger visual displays on tomorrow's control surfaces, but complementing rather than replacing traditional hardware.

"With limited physical space, especially in OB environments, designs will likely continue to become more modular, so a single platform can meet many needs," Waite said. "It's all about balancing the need to handle many sources and functions with instinctive, split-second access. That's why we'll never see live mixing go totally 'in-the-box.' A tactile user interface still works best, which is why faders and knobs will never go away. You can't take the wand away from the wizard."

By Jack Kontney "Audio Technology Update" newsletter writer



Cloud computing can reduce costs

TIM SHEPPARD, HEAD OF VIDEO INFRASTRUCTURE SOLUTIONS (EUROPE), CISCO

Substantial cuts in the cost of video production and contribution will follow the advent of cloud-based computing models exploiting commodity components for processing and moving high-resolution content. This is the view of Tim Sheppard, Cisco's European head of video infrastructure solutions, who believes this will also create new opportunities for smaller content production companies that previously could not afford their own systems for editing and contribution.

The cloud computing model delivers IT services more as a utility, gaining economies of scale through use of shared infrastructure both for processing and communication of data, and is already being deployed by some operators for video distribution, especially for over-the-top (OTT) services.

"We now see opportunities for service providers to offer cloud-based services for contribution and production as well, based around standard data centre technology," Sheppard said. "This will lead to very significant improvements in throughput and efficiency."

It will also encourage wider participation in content production, particularly in the case of the emerging market for 3DTV, which will for the foreseeable future be a niche field requiring additional bandwidth and equipment that only large companies could afford to own.

"If somebody wants to create a 3-D short program or movie, the amount of rendering needed is huge," Sheppard said. "So for that kind of application, it would be desirable for production companies to use external equipment. These are still early days, but we see that as a trend."

Sheppard also anticipated growing use of light compression at the video contribution stage, with JPEG 2000 and legacy MPEG-2 codecs predominant in the near term but growing use of MPEG-4 now that it is available in reliable, high-performance 10-bit profile versions.

By Philip Hunter, "Beyond The Headlines-Europe" newsletter writer



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Stations push to HD

STRATH GOODSHIP, PRESIDENT AND CEO, MIRANDA

Remarking on where the business environment is going, Strath Goodship, president and CEO of Miranda, said, "There is still a big push to HD, even in the U.S. Probably up to 50 percent of news studios still need upgrading. These are still the smaller markets. It has picked up in the last six months in the States."

And, he said, "The overarching trend, HD or not, is file-based infrastructure and the benefits that result. As equipment suppliers, we have to provide the tools not just to replicate workflows, but to allow them [our customers] to invent more efficient ones."

When asked, if there are barriers to a transformation from 'big iron,' he said, "The technology is not the limitation any more. What is more complicated is legacy infrastructure, plus business and human issues."

Miranda has been active in the 3-D space.

"3-D is not to be ignored, and penetration of receivers into homes is more than we expected," Goodship said. "Miranda has adapted many products, for example, to be compatible with 3Gb/s, which supports left/right processing with multiviewers and logo generators."

He adds, "Where we have been most successful selling products has been in OB vans. The real area for growth (of 3-D) is in live television, hence the OB vans. It's been an interesting discussion during the recession, but is not going to transform our industry."

Another hot topic is alternative delivery formats to over-the-air and cable systems.

"We are watching the over-the-top (OTT) trend, but it's still very small," Goodship said.

Referring to the existing businesses, Goodship remarked, "Advertising revenues in television are up; advertisers are still very much dependent on television to deliver their messages. We are still forecasting growth in TV infrastructure out to 2013, which is as far as we like to predict."

By David Austerberry, editor, Broadcast Engineering world edition

"3-D is not to be ignored, and penetration of receivers into homes is more than we expected."

The challenge of mobile

RICHARD FIORE JR., THOMSON BROADCAST VP SALES WORLDWIDE, TRANSMISSION & MOBILITY

Richard Fiore Jr., Thomson Broadcast VP sales worldwide, transmission & mobility, expects this year's NAB Show to see further evidence that mobile DTV will be top of mind for broadcasters interested in RF as they seek to tap into the content desires of consumers on the go. However, given the uncertainty created by the FCC as it pursues its National Broadband Plan, don't expect to see much more than discussion about Mobile DTV, he said.

"Everybody is thinking about it, but no one will do anything about it until the FCC takes action," Fiore said.

Given the position PCs and Macs have established in consumer homes and offices over the past 20 years and the popularity of smartphones and tablets today, Fiore said he understands the government's perspective.

"But I am not always sure they take into account everything," he said. "They have a vision, and I am not always sure that everybody's vision is 20/20. There always seems to be a prejudice toward one segment or another, and right now they are favoring broadband."

If the commission remains committed to favoring wireless carriers of broadcasters and moves forward with its plans to recoup 120MHz of TV spectrum, Mobile DTV could be seriously affected, he said. That's because the success broadcasters will have in attracting a mobile audience will be directly tied to the ability of viewers on the go to depend on being able to receive the Mobile DTV signal.

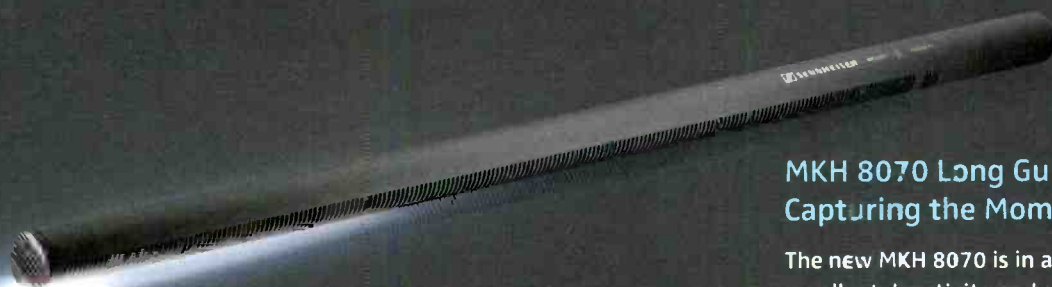
It boils down to QoS, Fiore said.

"How much do you have to pay for quality of service in terms of bandwidth usage?" he asked. "In mobile, depending on what you want to deliver, you need forward error correction, which can double or quadruple the video bandwidth of the encoder. It all comes down to bandwidth. How much bandwidth do broadcasters have to play with?"

By David Austerberry, editor, Broadcast Engineering world edition



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The importance of international markets

NICK RASHBY, PRESIDENT, AND PAUL WEISER, VO, SALES & MARKETING, AJA VIDEO SYSTEMS

One company that looks to international markets is AJA Video Systems. *Broadcast Engineering* met with Nick Rashby, president, and Paul Weiser, VO, sales & marketing, at a recent show in London. AJA started out as a small Californian vendor. Paul Weiser explained how the company has expanded.

"We have dealers and distributors all around the world. We can continue to grow the (international) business," he said. "We find the business is a little different in each part of the world. By attending national shows, we get to see what is going on in the different countries."

Nick Rashby continued, "As the world recovers from the downturn, you need to understand which parts of the world are recovering to put your focus. AJA has expanded from a small company that only did domestic business and has expanded into international markets. Now that business is a major focus."

Weiser said, "Doing business is different in Asia from Europe or North America, and if you don't pay attention to that detail, you don't do well." Product certification is just one issue that exporters have to deal with. "WiFi approval is a challenge," Weiser said. "You have to certify in-country in some Asian countries."

Commenting on a recent collaboration with Avid to provide interface hardware, Weiser said, "We are seeing the software companies focus more on the software, and customers are demanding products that work with multiple products on multiple platforms."

Vendors like AJA are providing products that offer cross-platform support for major NLEs.

By David Austerberry, editor Broadcast Engineering world edition

"By attending national shows, we get to see what is going on in the different countries."

IP audio control systems

FELIX KRUECKELS, SENIOR PRODUCT MANAGER, MC² SERIES, LAWO

Felix Krueckels, senior product manager, MC² series for Lawo, said, "IP audio has the potential to completely change the audio world. Right now, we see a Babylon of digital standards (AES-3, MADI, Ethersound, Optocore, Cobra-Net and others) being used in local area networks, with another protocol like ATM for Wide Area Network applications. IP audio allows the same protocol to be used for local and long-distance transportation of signals."

An IP audio standard would also expand the capabilities of today's routing systems, with increased channel count and increased functionality.

"It could be that we will have a more decentralized routing structure," Krueckels said. "With everything under IP control, including stage boxes, DSP processing and the audio itself, the only limits would be how many boxes you can network together and still handle all the IP traffic. But this is nothing compared to what the telecom people are doing already."

In terms of console design, Krueckels sees a continued migration toward touch-screen operation, with the reassuring news that the familiar channel faders will be staying with us.

"Like playing a musical instrument, operators need this tactile feedback," he noted. "We will always have faders. But everything else will move more and more into touch screens. It's much more flexible and easy to implement DSP and EQ on touch screens, and more cost-effective than having hundreds of knobs, LEDs and encoders."

Lawo sees customization as another major benefit of this approach.

"Rather than having fixed hardware surfaces devoted to a specific application, like broadcast studios, OB vans, etc., a software-based design approach allows more customization," Krueckels said. "Different software configurations can be used to optimize the control surface for a wide range of jobs. So there will be perhaps fewer physical platforms, but with much more flexibility."



By Jack Kontney, "Audio Technology Update" newsletter writer

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Mobile DTV deployment

DAVE BENCO, NATIONAL KEY ACCOUNT MANAGER, ROHDE & SCHWARZ.

With the FCC's push to implement its National Broadband Plan and incentive auctions, television broadcasters are being cautious, said Dave Benco, national key account manager, Rohde & Schwarz. This translates into an unexpected hesitation in Mobile DTV deployment.

"The issue for VHF is a fundamental one," Benco said. "The physical antenna has to be bigger than a handheld device."

Additionally, viewers of VHF broadcasters in some markets post DTV transition experienced reception problems.

"One of the ways we could help is more power, but that doesn't come without other issues — like interference," Benco said. "VHF mobile reception has not been given the same priority as UHF mobile. If the FCC ultimately forces UHF broadcasters into VHF spectrum, more work will need to be done on mobile receivers"

Another related topic likely to receive a lot of attention at the NAB Show is distributed transmission and single-frequency networks (SFNs).

"SFN architecture will be critical to offering the quality of service necessary for a mobile offering," Benco said. "Without it, certain areas will go unserved, which won't be acceptable to viewers on the go."

However, it is "absolutely the wrong idea" that broadcasters can "start sprinkling more transmitters" in their service area with ATSC because doing so "could cause as many problems as it solves," he said.

"SFNs and receivers will be the two main topics we will see broadcasters grappling with over the next 12 to 18 months. How do I get a better quality of service for the mobile environment?" he asks rhetorically.

Improved equalizers built into Mobile DTV receivers will help, he said, "but broadcasters will always be restrained by the legacy A/53 installed base of receivers. At some point, when it comes to network planning, broadcasters will begin weighing fixed vs. mobile service. At some point, you favor mobile over fixed, but we're not there yet."

By Phil Kurz, "Over The Top" newsletter writer

"SFN architecture will be critical to offering the quality of service necessary for a mobile offering."

Economic recovery is here

BY HARRIS MORRIS, PRESIDENT OF HARRIS CORPORATION'S BROADCAST COMMUNICATIONS DIVISION (BCD)

Harris Morris, president of Harris Corporation's Broadcast Communications Division, sees signs of recovery since 2009.

"The indicators we watch show global advertising revenues are rising, six percent in 2010, and set for six percent in 2011, with revenues set to top half a trillion dollars in 2011, and the TV sector is getting its share."

How does Morris see the primary technology trends?

"There is a real blend of broadcast and IP-based technologies," he said.

Baseband video must coexist with file-based systems for some time to come.

"The challenge is that so much is happening, and broadcasters want to try to experiment and evolve the infrastructure without the risk of stranded technology or stranded costs, and to maximize the ROI," he said. "We have brought to a number of our products the ability to handle broadcast and IP signals and technologies — files and streams. It's evolving as a hybrid infrastructure, and it's going to be the reality for quite a time."

Another technology trend is "enhancing and simplifying the user experience (for operators) in managing the technology," Morris said. "The complexity of the task has increased; managing that technology has got to get easier."

Morris believes that you should "allow troubleshooting and configuration to be done visually and more simply. We see those two cutting across everything from transmitters, to video networking and to DAM, and editing."

He sees the technology trends are response to the business issues — the proliferation of content, formats and delivery channels. "One thing we believe is you cannot do technology for technology's sake," he said. "Now you have to deliver a concrete business purpose. We think the money is coming back to the business, but procurement cycles are longer. Buying decisions are more business- and ROI-driven. There is more involvement of financial people in the purchases."

By David Austerberry, editor, Broadcast Engineering world edition



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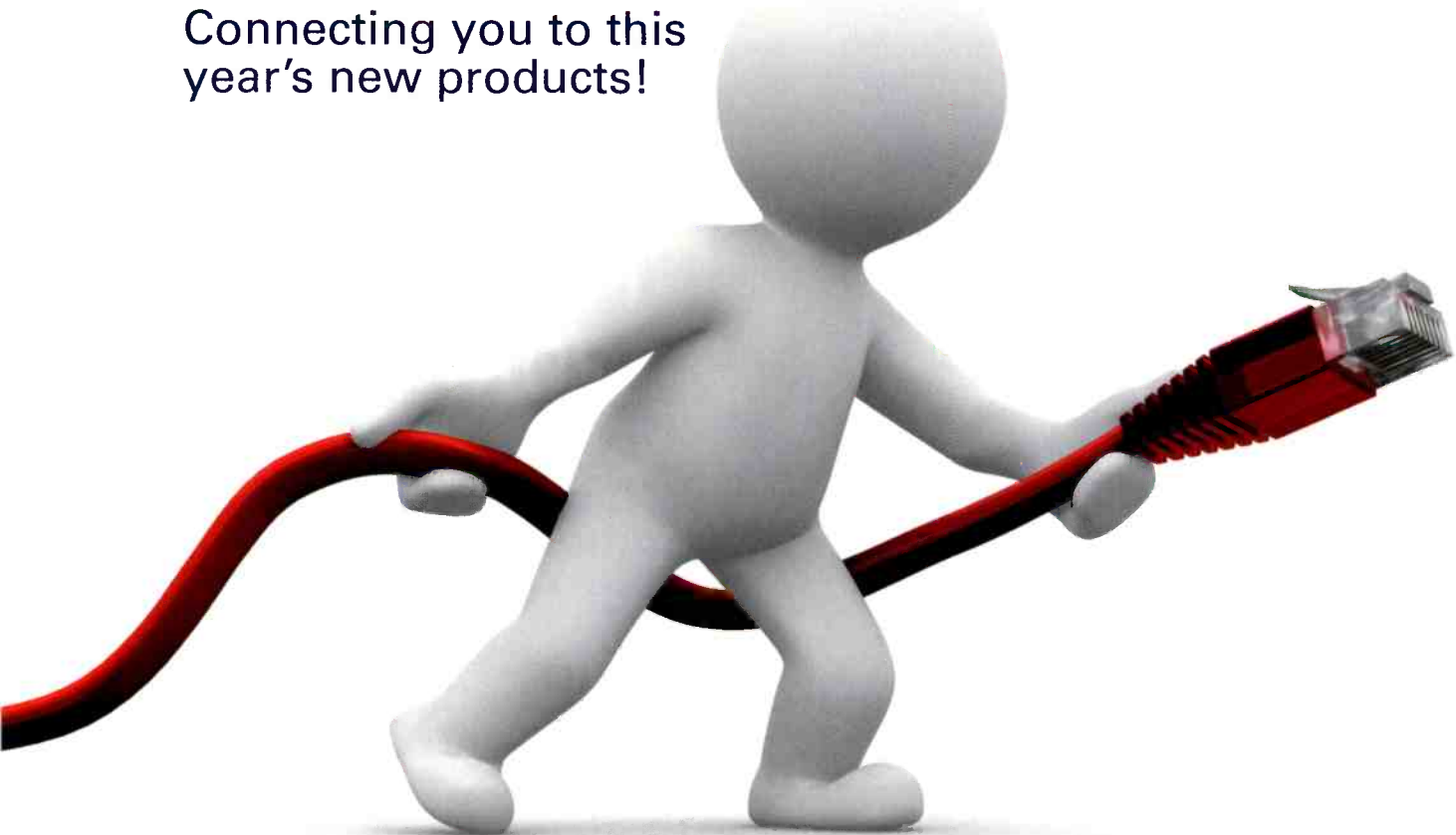
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201-930-1000; sony.com/professional
Booth: C11001

TEST AND MEASUREMENT PLATFORM

Hamlet DS900

Designed for signal monitoring in busy production or master control areas; the current Hamlet DigiScope performs multiple tests simultaneously, displaying up to four windows on an external display; the DS900 features the capability for four inputs and a multiviewer, so on a large screen there can be four windows for each of the four signals; the unit's modular structure means that the inputs can be different formats: analog or digital, component or composite, or standard definition or HD.

+44 1494 729 728; www.hamlet.co.uk
Booth: C4841

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CONNECTORS

FIRMWARE UPDATE Clear-Com Eclipse Digital Matrix System v5.2

Enhancements include the capability to show graphical audio levels in real time; comes with a preset factory configuration; finds matrices and panels connected to the frame via IP; new IP-based audio level monitor card, the LMC-64, enables the Production Maestro Pro to utilize the Clear-Vu Audio Metering; using two standard scaling options, Nordic and VU, users can monitor and adjust audio levels with the click of a mouse.

**510-337-6600; www.clearcom.com
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CABLE DRUM Schill SL 500



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**781-221-4000; www.signiant.com
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**949-777-5435; www.vidovation.com
Booth: C7248**

SUPER 35MM CAMCORDER Sony PMW-F3

Uses newly developed Exmor Super 35 CMOS image sensor, providing shallow depth of field, high sensitivity (F11/ISO800) and low noise (S/N 63dB); PL lens mount; provides MPEG-2 long GOP 35Mb/s 8-bit recording with SxS card; RGB & S-LOG output option over HD-SDI dual-link; 3D-link option connects two cameras for synchronized and 3-D operation; S-Log and Hyper Gamma image creation modes support raw negative imagery; uses SxS memory cards; available with or without lens.

**201-930-1000; sony.com/professional
Booth: C11001**

MOBILE TV LOUDNESS CONTROL DaySequerra M2DTV



Designed to keep DTV audio content intelligible in noisy environments on small mobile devices; includes 5.1 surround, stereo and EAS inputs; features DTS DownMix and two codec preprocessing channels, each optimized for 24kb/s, 32kb/s, 48kb/s and 64kb/s to reduce artifacts from lossy compression schemes and low-bit-rate transmission; makes corrections in the program loudness to keep dialog intelligible and playback at a consistent loudness level on the mobile device without users constantly adjusting their volume control.

**856-719-9900; www.daysequerra.com
Booth: N3830**

H.264 AVC ENCODER Fujitsu IP-9400

Enables HD content to be carried within an existing SD channel; when combined with the optional built-in DVB-S2 modulator, the unit is designed to provide up to 70-percent bandwidth saving compared with older MPEG-2 systems; for DENG and DSNG operations where the best video fidelity is needed within the lowest possible channel bandwidth.

**949-855-5543; www.fujitsu.com
Booth: SU7521**

CAPTION AND SUBTITLE ENCODING SOFTWARE Softel Swift vTX

Enables broadcasters to repurpose content regardless of file format; allows users to switch between SD and HD formats easily to facilitate multiplatform and worldwide distribution; supports a large array of files, wrappers and playout formats, facilitating the integration of captioned or subtitled content across a wide range of media servers and editing solutions.

**+44 118 984 2151; www.softelgroup.com
Booth: N5829**

MULTIVIEWER Harris HView SX Hybrid

Designed for hybrid applications with routing and monitoring of both traditional and IP signals; combines baseband and broadband monitoring, graphics, and optional test and measurement tools for baseband signals in a single chassis; built to reduce integration costs and enable a more efficient use of space; resides within the output section of the Harris Platinum router frame; available as a multiviewer-only or multiviewer/router integrated system.

**800-231-9673
www.broadcast.harris.com
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LOUDNESS METERS TC Electronic TC TouchMonitor TM7, TM9



Features a touch screen, consistent loudness readout and compatibility with American, European and Japanese broadcasting standards; TM9 comes with 16 digital balanced I/O and a 9in screen; TM7 features eight analog plus eight digital I/O and a 7in screen; can also be expanded by installing optional software instruments.

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+44 1234 855222; www.polecam.com
Booth: C8013

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949-777-5435; www.vidovation.com
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206-956-0544; www.streambox.com
Booth: SU1702

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Vinten Radamec Fusion FHR-35**

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845-268-0100; www.vintenradamec.com
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530-478-1830
www.ensembledesigns.com
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+47 22 889750; www.t-vips.com

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207-655-8100; www.spxcomtech.com

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Florical Acuitas



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352-372-8326; www.florical.com

Booth: N5011

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+49 221 709 130; www.rtw.de

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+44 207 183 1500; www.s-and-t.com

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Systems Dugan-MY16

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714-522-9011; www.yamahaca.com

Booth: C1325

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201-930-1000; sony.com/professional

Booth: C11001

PORTABLE BROADCAST-IP PROBE
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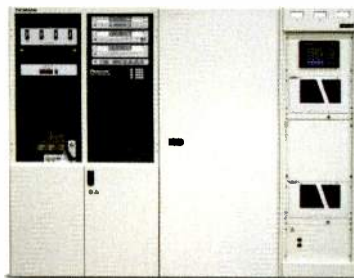
New plug-in module provides an IP input for ASI streams; module allows users to manage the interface while retaining the existing backup ports in native ASI transport stream format; for DAB broadcasters, the ETI over IP module plugs into the available expansion slot to provide a low-cost, low-profile, high-impact system; new satellite receiver module expands input options via the exciter plug-in slot, allowing broadcasters to download content from a satellite and feed it directly into the exciter without the need for external devices.

800-231-9673; www.broadcast.harris.com

Booth: N2502

DTV TRANSMITTER

Thomson Broadcast DCX Paragon

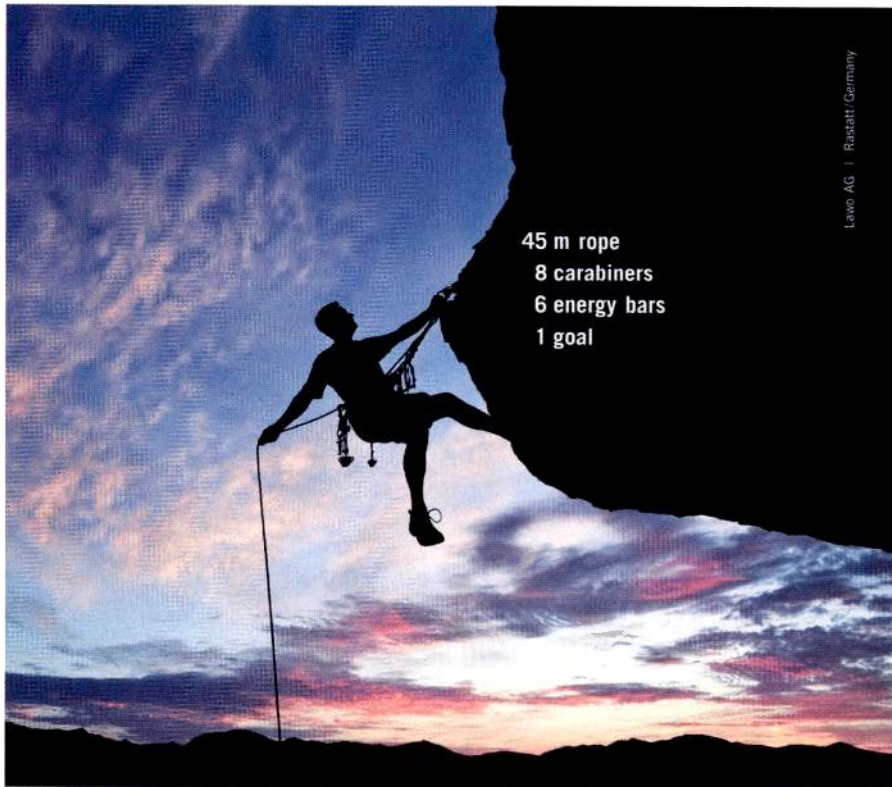


For high-power UHF and ultra high efficiency operation; uses MSDC-IOT technology that operates up to 60-percent efficient and saves up to 33 percent off current electricity bills; features an internal cabinet oil cooling system and Soft-Arc Technology — eliminating the crowbar — for improved reliability.

413-998-1100

www.thomson-broadcast.com

Booth: SU4917



45 m rope
8 carabiners
6 energy bars
1 goal

Lawo AG | Rastatt | Germany

Focus on functionality — the new mc²66.

Inspired by your needs — the mc²66 MKII. Not only does this much developed mc²66 MKII stand out with proven efficiency and outstanding functionality, but also with its new features, which once again make high tech equipment from Rastatt a worldwide standard for mixing consoles. Now you can benefit from the latest touch screen displays, a revised layout and totally reliable control computer redundancy. One of the best consoles available suddenly became even better. Only one thing has not changed: The mc²66's outstanding usability, which will continue to inspire audio engineers in OB trucks, studios and theatres. For more information visit www.lawo.de



See us at NAB 2011
Las Vegas, April 11–14, Booth C2628

Networking Audio Systems



DTV AUDIO/LOUDNESS MANAGER

Linear Acoustic AERO.one



Designed to manage loudness, upmixing, metadata, signal routing and audio coding; 1RU product is ideal for affiliate stations that need to match local and network content and provide a seamless surround sound experience for their viewers; also well suited as a processor for the backup transmission path; available in three versions — dual stereo (2+2), surround sound (5.1) and both (5.1+2); HD/SD-SDI I/O and dual power supplies are now included as standard features.

717-735-3611; www.linearacoustic.com

Booth: SU3326

AUDIO SYNCHRONIZATION SOFTWARE

Singular Software DualEyes

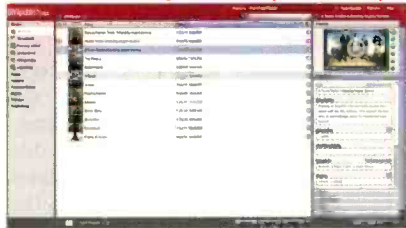
Automatically syncs and cuts audio recordings into clips that match video clips from dual-system audio setups as often used with DSLR camera video; a stand-alone application, it can be used with any NLE software application, from consumer level to comprehensive professional production suites.

604-897-9072

www.singularsoftware.com

Booth: SL3327F

VIDEO PUBLICATION PLATFORM
Front Porch Digital DIVApublish mpx



Enables users to extend existing digital file-based workflow from DIVArchive through to publication of content to online communities and VOD systems; supports a wide range of new business opportunities; users can scrutinize content down to the frame level, and then annotate it automatically and precisely using advanced tools such as facial recognition, scene detection, speech recognition, natural language processing, ad-break detection and closed-captioning time alignment; enables customization and enhancement of metadata through manual notation.

303-440-7930; www.fpdigital.com
 Booth: N5806

AUDIO MONITOR
TSL PAM1-3G16

A natural evolution of the PAM1-3G8, this new addition to the PAM product family combines the size and convenience of the original 1RU multichannel audio monitoring unit with a full 16 bar graph display and many of the advanced features of the PAM2-3G16, such as loudness measurement, preset standard switching and advanced monitoring mode selection.

+44 1628 676 200; www.tsl.co.uk
 Booth: N1119

UNIVERSAL MEDIA READER/WRIter
Sonnet Technologies Qio E3

For users who do not require the full feature set of the Qio, the cost-effective Qio E3 enables them to obtain the functionality they need without paying for the features they don't; is a three-slot SxS reader that doubles as a three-slot bus expansion system for ExpressCard/34 adapters; designed for in-studio and on-location use.

949-587-3500; www.sonnettech.com
 Booth: SL9605

NEW MEDIA PUBLISHING SYSTEM
SeaChange AssetFlow and Web Business System

AssetFlow is an enterprisewide, converged solution for receiving, managing and publishing video content for multiscreen delivery; accessible by a Web-based interface and fully automates asset transformation through rule-driven workflows; Web Business System consists of different tools for broadcasters to introduce a subscription service for online video, to dynamically insert ads based on subscriber data and to promote online video via intelligent navigation and promotional packages.

378-897-0100; www.schange.com
 Booth: N4319

DISC ARCHIVE
Sony XDCAM Juke

All-in-one compact disc library and archive system; includes dual drives, two bins each with 15 discs and HDD cache; supports quad-layer discs for 120HR online storage; automatic multidisk ingest operation.

201-930-1000; sony.com/professional
 Booth: C11001

Re-Defining Media Archive Workflow
 LTO-5 Video Archiving Recorder: LTR-100HS



The LTR-100HS uses the latest generation of Linear Tape Open (LTO) drive technology, enabling a managed media migration path and open file system for a simplified long-term video archive system. With its massive 1.5TB capacity (50 hours @ 50Mbps) the LTR-100HS can be used for production libraries, broadcast archives or program distribution and exchange.

www.for-a.com

- Head Office (Japan) Tel: +81 (0)3-3446-3936
- USA Western (CA) Tel: +1 714-894-3311
- USA Eastern & Midwest (NJ) Tel: +1 201-944-1120
- USA Southern (FL) Tel: +1 305-931-1700
- Latin America & Caribbean (FL) Tel: +1 305-931-1700
- Canada (Toronto) Tel: +1 416-977-0343

Continuous Innovation

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ROBOTIC VIDEOTAPE INGEST SOLUTION

Altran Technologies ViTaDi-AutoRoboPack-Betacam



Four-channel solution in double flypacks ingests Betacam tapes; includes ViTaDi AutoPack and RoboPack (Flexicart robot hardware, racks, tape bins for 60 tapes, SDI converters and cable harnesses) loaded with four Betacam VTRs of choice, including Betacam Oxide, Digibeta, SP and SX; preinstalled master control software organizes and monitors the workflow process and also functions as a master database repository for multiple systems; includes installation, first-year maintenance and 24/7 support.

818-998-9100
www.alteranttechnologies.com
Booth: N5537

CONVERSION CARDS
Cobalt Digital Fusion3G



All Fusion3G cards now have Dolby transcoding and EAS audio ducking available; a Dolby E stream can be decoded to baseband (and channel-swapped or optionally loudness-processed) and then re-encoded into Dolby Digital or Digital Plus; for EAS audio ducking, input mixing allows the set up of ducked mixing 5.1 or stereo program audio and EAS audio; custom mixes can be saved on the card and then recalled using the card's GPI input; when a GPI trigger occurs, the card goes to the ducked mix, and when the trigger clears, normal routing is restored.

217-344-1243; www.cobaltdigital.com
Booth: N2512

MULTIVIEWER

Avitech International Sequoia 2x2V

Features a switching function for keyboard/mouse, USB hub, speakers and microphone; allows users to control up to two computers and oversee up to two video sources on a single monitor; all input windows are freely adjustable and have full-screen capability; fan-less; takes HDMI, DVI-I and HD/SD-SDI inputs.

425-885-3863; www.avitechvideo.com
Booth: SL9120

AUTOMATION SOFTWARE

Telestream Vantage 2.0

A major new feature includes the Vantage Workflow Portal, which enables creation and deployment of operator user interfaces in minutes for browsing video, entering metadata and forwarding media; a new SDK allows customers and third-party systems to access and control Vantage workflows easily; GraphicsFactory integration allows template-based layered graphics and audio to be applied during a transcode.

530-470-1300; www.telestream.net
Booth: SL3309

VIDEO EDITING SHARED STORAGE SYSTEM

Sonnet Technologies RX1600Fibre



Available in 16TB or 32TB configurations; provides direct, high-speed access to assets for up to four users without a dedicated server or an added Fibre switch; employs a four-port 8Gb Fibre Channel interface; delivers aggregate bandwidth up to 1000MB/s read; integrated SAS expanders enable RX1600 Expansion enclosures to be connected; RAID 5 and RAID 6 formatting support, SCSI Enclosure Services 2.0 compliance, and enhanced S.M.A.R.T. data reporting offer increased reliability.

949-587-3500; www.sonnettech.com
Booth: SL9605

REMOTE WAVEFORM MONITOR DISPLAY
DK-Technologies PT0700R Client Panel

Allows broadcast engineers to access the facilities of the PT0760M (and the entry-level PT0710M) from an entirely different location; an engineer in one location can see exactly the same audio and video display as the engineer in the MCR and can access all the facilities of the PT0760M without interrupting its use at the master location.

800-421-0888
www.dk-technologies.com
Booth: C7840

AUDIO/VIDEO PROCESSING MONITOR

Wohler AMP2-16V



Enhancements include support for SMPTE 2020 metadata monitoring, a menu lockout function that prevents unauthorized changes to the unit's configuration, the ability to cycle through solo monitoring of defined clusters of audio channels at the press of a button, an optical SPDIF input option for monitoring the consumer's STB experience, and improved display of metadata and stream status information.

510-870-0810; www.wohler.com
Booth: N2524

GRAPHICS CREATION SOFTWARE
Chyron Lyric PRO 8



Features include native support for stereoscopic 3-D, scriptless transitions and touch screen-enabled graphics; ideal for sports and news applications; cloud-based content-creation tools have been extended to Lyric PRO 8 with the introduction of Web-enabled control over Lyric messages and layout.

631-845-2000; www.chyron.com
Booth: SL1520

Q: WHAT DO YOU CALL PEOPLE
WHO COMPLAIN
ABOUT YOUR AUDIO?

A: YOUR BEST CUSTOMERS.

Recipient of the
62nd Annual NATAS Technology
and Engineering Emmy® Award.



See the new 2RU AERO.air™ and the latest DTV audio solutions at NAB 2011. VISIT US AT BOOTH #SU3326.

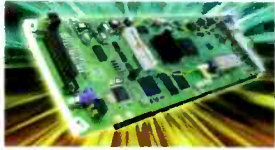
For every viewer who takes time to complain, there may be a thousand who just leave. Let's fix this. We've been solving DTV audio problems since before loudness complaints. From production to transmission, our products are built for one purpose - digital audio perfection. Find it in the AERO.air™ when you visit our website. Your critical customers will thank you for it (hopefully at under -24LKFS).

www.LinearAcoustic.com

 LINEAR ACOUSTIC®

Color indicates advertisers

UP/DOWN/CROSSCONVERTER
Crystal Vision Up-Down-AT/ATX 3G



Allows flexible up/down/crossconversion between 3Gb/s, HD and SD sources; can perform two conversions on one board; features motion-adaptive video deinterlacing and downconversion that includes four vertical filter characteristics, adjustable detail enhancement and noise reduction; offers flexible variable video delay of up to one frame adjustable in one-line steps, in addition to the standard minimum fixed delay of one frame minus 16 lines; supports aspect-ratio conversion of anamorphic, letterbox, pillar box and full screen; includes AFD functionality; provides audio routing by stereo channel; can pass ancillary time code from the input to the output and use the data to get the interlace phasing correct when downconverting from 1080p or 720p.

+44 1223497049; www.crystalvision.tv
Booth: N1520

TV MASK/FILTER COMBINER
Jampro Antennas UHF RWED-516-U



Cross-coupled design accommodates adjacent channels, meets stringent filtering standards and provides constant impedance performance for adjacent and channel separations greater than 15; provides the high isolation of traditional constant impedance technology and achieves elliptical response without external coupling mechanisms; large cavities handle high power with low insertion loss; filters are temperature compensated for closely spaced applications.

916-383-1177; www.jampro.com
Booth: C2307

OPTICAL STORAGE
Sony XDCAM drive

New dual-head operation provides higher-speed read/write: x2.6(read)/ x1.5 (write); supports quad-layer write-once discs, four-hour recording with HD422 at 50Mb/s; three-layer rewritable disc supported with version-up, USB 3.0 interface, and VFAM interface (Virtual File Access Mode) providing connectivity with major NLEs.

201-930-1000; sony.com/professional
Booth: C11001

AUTOMATION SYSTEM
VSN VSNMULTICOM

Version 9.10 features a new sophisticated metadata automatic insertion system for branding, integrated with Vizrt, Orad, Chyron and VSNCG+ graphic systems; this allows for a customizable parameter editing advanced control thanks to the new ad hoc module VSNLOGGER.

404-474-0040; www.vsn-tv.com
Booth: N1208



GET CONTROL. GET ZEUS.

Our 100% web-based EAM software puts you in complete control of your assets by tracking all of your resources so you can limit downtime and productivity, saving you time and money. **You just can't afford not to use Zeus.**

Zeus
BROADCAST
zeusbroadcast.com

Visit us at NAB Booth #N705



Reinventing the TV Experience *together*

Inside:

It is time to set media free from the traditional bounds of time, place, and platform. Find out how Cisco Videoscape™ is helping broadcasters work with their service provider partners to deliver the next generation of TV entertainment.



Welcome to the Future of TV: Cisco Videoscape



Today's consumers want more: more mobility, more control, and more ways to share and interact with video content. The market is listening. Cisco predicts more than 12 billion connected IP endpoints worldwide by 2014, with web content and services expanding across TV sets, tablets, game consoles, and other consumer electronics devices. For broadcasters, this represents an enormous opportunity to capture new viewers and monetize content in new ways. But so far, the online video experience is extremely fragmented.

Consumers have to use different devices and subscriptions to access all the content they want—and different interfaces and billing relationships for each platform. There is still no good way to search for content across all screens and services. This fragmentation is an even bigger problem for broadcasters and content providers, who must format content for all these devices and attempt to ensure the quality of that content, while trying to protect the content from theft. Even more troubling is that online video distribution models diminish the value of broadcaster content, offering no carriage fees comparable to traditional pay TV and lower advertising loads. Fortunately, there is a better solution.

Unlimited Content, Anywhere, Anytime, on Any Device

Cisco® Videoscape is the comprehensive Cisco solution for delivering the next generation of TV experience. With Cisco Videoscape, service providers can join content and applications from various sources, such as linear TV, online video, and video-on-demand, into an immersive, unified experience. And they can extend this experience across any managed or unmanaged network, to any managed or unmanaged device.

The Cisco Videoscape experience is delivered by service providers but offers significant benefits for broadcasters and content providers. It lets them:

- **Expand the reach of premium content to almost any device or screen**, while protecting it and preserving its value
- **Maintain existing carriage fee and advertising business models** by strengthening partnerships with service providers
- **Deliver new levels of interactivity around content** with web and social capabilities
- **Offload the burden of formatting content** for different devices and services
- **Deliver a premium quality of experience** through service provider cloud and network capabilities that best-effort online video services are unable to match
- **Monetize content in new ways** by supporting new subscription, purchasing, and advertising options

Cisco Videoscape is an end-to-end solution, encompassing the cloud, the network, and next-generation clients that expand the way consumers can access and interact with content. This unique combination of cloud, network, and clients working together as one lets broadcasters deliver an amazing range of new and profitable content experiences to their viewers across multiple screens, with outstanding quality.

A Next-Generation Cloud Platform

Cisco Videoscape exploits the full power of the cloud to deliver new kinds of media experiences. At the center of these capabilities is the Cisco Videoscape Media Suite, an intelligent cloud engine built to deliver the next generation of multiscreen media experiences. The Cisco Videoscape Media Suite allows service providers to efficiently manage, publish, and monetize media content from almost any source, and deliver that content to the living room—or to any other location or mobile device. The solution provides tools to:

- **Aggregate content:** The Cisco Videoscape Media Suite lets service providers aggregate catalogs and metadata from multiple sources (such as content management systems, broadcaster catalogs, or Netflix) and combine them into a single catalog for unified search and recommendation. For the consumer, all of this is transparent. A search for a favorite TV show, for example, could return options to watch the show live, record it later, stream it from Netflix, or purchase an episode or season from an online retailer.
- **Protect content:** A comprehensive entitlement framework lets service providers protect, distribute, and monetize content across multiple screens. The Cisco Videoscape Media Suite supports customized product rules and dual router mode (DRM) use terms for subscription, rental, advertisement-supported, and entitlement models. It lets broadcasters and service providers manage entitlements in a common “rights locker.” With cloud-based entitlement tied to the user—instead of to a specific device or platform—consumers can purchase content once, and then access that content on multiple screens or devices.
- **Monetize content:** The Cisco Videoscape Media Suite supports multiple content business models (advertisement-supported, purchase, rental, and subscription) and delivery models, including traditional pay TV and video on demand (VoD) systems, download, and streaming. Integrated social networking options allow consumers to share and recommend content to friends. Broadcasters can also embed suggestions for related content for viewing or purchase throughout the Cisco Videoscape interface.

Delivering Superior Quality, Over Any Network, to Any Device

Tomorrow’s media experiences may be powered by the cloud, but delivering those experiences efficiently and with high quality is not a simple task. Video applications have stringent performance and resiliency requirements, and even a single lost video packet may result in a visible impairment to the end user. Successfully delivering cloud-based media services requires a lossless video architecture—a resilient IP transport network that meets rigorous requirements for video, including ample throughput, minimal delay and jitter, and zero packet loss.

Cisco combines industry-leading experience in deploying carrier-class IP and Multiprotocol Label Switching (IP/MPLS) networks with a deep understanding of video services. As a result, Cisco is exceptionally capable of meeting the requirements of broadcasters and service providers for transporting premium video services. Cisco provides:

- **Lossless transport over IP networks:** The Cisco Video Optimized Transport Solution provides an intelligent, highly reliable transport network for cloud-based media and applications. It is based on a medianet architecture—an infrastructure that is network-aware, media-aware, and device-aware, and that is optimized for video applications and communications. The solution draws on the Cisco IP Next-Generation Network (NGN) routing and video infrastructure portfolio to deliver industry-leading scalability and performance, continuous availability, and video-grade resiliency.
- **Consistent quality over managed and unmanaged networks:** The Cisco Content Delivery System (CDS) provides an intelligent, video-optimized content delivery network (CDN) platform that incorporates TV streaming for high-quality content delivery to digital TVs and set-top boxes (STBs), as well as Internet streaming to deliver content and applications to connected IP devices. It provides dynamic service routing intelligence to deliver content to users from the best available source (using parameters such as location, network condition, streamer load, content affinity, and business rules), and employs adaptive bit-rate streaming capabilities to deliver consistent quality over the unmanaged Internet.

Content delivery to any screen: To deliver the full power of the cloud across multiple screens and networks, service providers need all elements of the system to function together as one. Cisco Conductor for Videoscape orchestrates services, devices, and subscriber management functions across clients, clouds, and networks, including those that are managed and those that are not managed by the provider. As a result, broadcasters and service providers can deliver the full promise of Cisco Videoscape.



Cisco, Broadcasters, and Service Providers: Reinventing TV *together*



The future of TV and media entertainment is here, powered by the cloud. With Cisco Videoscape, broadcasters can partner with service providers to reinvent TV for consumers, and deliver more unified, interactive, mobile, and profitable media experiences. Cisco is ready to partner with broadcasters and service providers in this endeavor. Cisco can provide:

- **A comprehensive IP video architecture** that encompasses the video back-office cloud, the media-optimized network, and client solutions, all working together to deliver unified, immersive experiences
- **A premium quality of experience** that surpasses best-effort media delivery by drawing on embedded intelligence that extends across the cloud, network, and clients
- **Proven industry leadership** providing innovative video, CDN, IPTV, and data center solutions for many of the largest, most successful broadcasters and service providers in the world

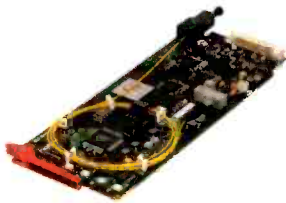
To find out how Cisco Videoscape can help you take advantage of new consumer experiences and video business models, visit www.cisco.com/go/videoscape.

www.cisco.com/go/videoscape

together we are the human network. 

TIME DIVISION MULTIPLEXER

**Nevion SDI-TD-3GMX-5/
SDI-TD-3GDX-5**



Transports two synchronous or asynchronous SD/HD-SDI signals; can be configured to transport two HD-SDI into 3G-SDI or four SD-SDI and one HD-SDI into 3G-SDI; by combining SDI-TD-MUX/SDI-TD-DMUX, it is possible to transport eight SD-SDI signals over one 3G-SDI link; modules can be configured with optical transmitters and receivers for different optical schemes — short haul, CWDM or DWDM.

**800-515-0811; www.nevion.com
Booth: SU7217**

REMOTE PAYOUT SYSTEM

PlayBox Technology Remote Payout

Provides a tapeless, file-based operation that has two parts: one integrated with the broadcast center and the other at the remote site; at the broadcast center, it is fully integrated into the current or preferred systems including traffic, storage, MAM, ingest, transcoding and file transfer systems; connects to the remote site's payout equipment via the public Internet.

**404-424-9283; www.playbox.tv
Booth: N5835**

PRODUCTION SWITCHING

Snell Kahuna 360

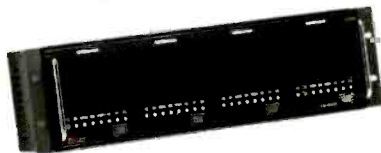


Supports 16 simultaneous broadcast productions and a mixture of SD, HD and 1080p in a single mainframe; has up to six M/Es and seven keys per M/E, as well as a sophisticated 3D DVE package; includes the company's Make M/E technology, which makes it easy for operators to leverage available mixer power and create a tailor-made M/E — selecting inputs, keys, stores, DVE and outputs — for a specific output requirement and, as a result, free up resources to users for other productions.

**212-481-2416; www.snellgroup.com
Booth: N1820**

MONITOR

TV One LM-404HD



Multiformat quad color LCD monitor; monitors a multitude of video signal formats; high brightness, wide viewing angle, excellent contrast ratio and high-definition color; inputs for SDI (either SD or HD) with an active output, analog RGBHV, YPbPr component video, and a composite video and a YC input; supports and automatically detects NTSC and PAL television standards.

**859-282-7303; www.tvone.com
Booth: C5647**

VIDEO CAPTURE CARD

AJA Video KONA 3G



Features 10-bit uncompressed video I/O, the newest HDMI 1.4a support for 3-D workflows, 16-channel SDI embedded audio I/O, and up to 16-channel AES digital audio I/O (eight with breakout cable or 16 with optional K3G-Box); includes real-time hardware-based up/down/crossconversion for working with a wide variety of SD and HD, 3G, dual-link HD and even 2K formats, and a hardware downstream keyer for compositing graphics without rendering.

**530-274-2048; www.aja.com
Booth: SL4420**

CAMERA MOTION CONTROLLER

Shotoku CMC

Enhancements make the self-contained head, height and lens controller even more flexible in terms of remote configuration and support for interfaces to all types of lenses; customers may use any type of, any age of and any manufacturer of lens; regardless of the interface used, the CMC is easily configured to match the installed lens and can be customer-adjusted to support a change of lens in the future.

**310-782-8491; www.shotoku.tv
Booth: C8528**

RIEDEL

See

AUDIO MONITOR
TSL PAM2-3G16



Latest software release adds a number of key features, including Aux Input Mixer, which allows users to mix an auxiliary audio feed such as an intercom signal into their monitoring output—ideal for use in any environment where headphones are worn during production; also adds a Split Mono Scroll Mode and a new monitoring setup, which enables operators to access monitoring functions such as Downmix, DRC, LtRt, phase swap and mono mix without the need to access any secondary menus; the update is free to new and existing PAM2-3G16 owners.

+44 1628 676 200; www.tsl.co.uk
Booth: N1119

NLE
Avid Media Composer 5.5



Works with practically any media format; captures, monitors and outputs with AJA Io Express; edits HDCAM SR Lite footage natively; accelerates AVC-Intra workflows with Nitris DX AVC-Intra; better search capabilities; finds video clips based on a spoken word or phrase.

978-640-6789; www.avid.com
Booth: SU902

GAP-FILLER SOLUTIONS
Linear Industries

Gap-filler series for ISDB-Tb and ATSC standards; designed to improve DTV coverage in areas obstructed by terrain and buildings — or in areas where higher signal strength is needed for indoor reception; mobile DTV ready; offer automatic power limit, automatic linear and non-linear precorrection, gain-margin monitoring, echo cancellation, and automatic gain control; range of models and output power is available.

847-809-5885; www.linear-tv.com
Booth: SU4905

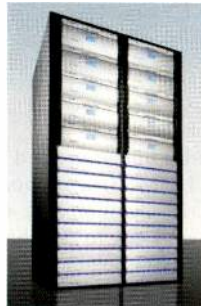
ON-CAMERA MONITOR
Marshall Electronics
V-LCD70XP-HDMIPT



Allows camera operator to pass through the HDMI video input from the monitor to another monitor for a client, director, focus puller or crew/talent member to view on-location; includes composite and component inputs, HDMI pass through, DSLR ratio adjustment, adjustable backlight and markers, HDMI auto color space and ratio detect, manual gamma adjustment, image flip, 1/4in-20 mounting on all sides, and a power switch; 7in screen.

310-333-0606; www.lcdracks.com
Booth: C6419

STORAGE SOLUTION
DVS Digital Video DVS-SAN



Storage solution is custom-tailored with the latest technology to provide optimum performance in high-resolution post-production workflow; in addition to entry-level and midsize storage systems, SAN delivers powerful enterprise storage solutions to meet the highest performance demands; powers workflow while reducing energy costs and offering more storage capacity per unit space.

818-846-3600; www.dvs.de
Booth: SL3305

SATELLITE SERVICE
Stratos BGAN

High-speed wireless IP data (up to 492kb/s) and circuit-switched network; streaming IP data rates up to 384kb/s on demand; data and voice can be used simultaneously; GAN-standard 64kb/s ISDN, Fax and 4.8kb/s voice to fixed, mobile and any other MSS.

709-748-4844; www.stratosglobal.com
Booth: OE2346

STORAGE AND ARCHIVE SYSTEM
EditShare Ark



Offers media protection for broadcast and post, providing hard disk and tape-based options for backup and archiving; enhancements include a new partial file restoration capability that supports virtually any codec, letting users move only a portion of the media file whether it be 20 seconds of a 10-hour piece or several sections within the file; helps facilities convert their videotape archives into a file-based archive; retrieves tape information from the station's archive database, sends out digitized assignments, performs the QC process and migrates the files to the file-based storage.

617-782-0479; www.editshare.com
Booth: SL4728

LOUDNESS QUALITY MONITOR
Linear Acoustic LQ-1000



Employs the ITU-R BS.1770 method for measuring loudness; displays the results in a logical, easy-to-understand format; a colorful, long-life OLED display groups critical loudness parameters, such as three adjustable integrated loudness measures, loudness history, current peak level, maximum peak level and the loudness target; adds as standard features a simple "gain apply" scaling function and HD/SD-SDI I/O.

717-735-3611; www.linearacoustic.com
Booth: SU3326

ADVERTISING MANAGEMENT SOFTWARE

Broadway Systems Version 7.0

Features significant enhancements including a newly engineered Deal Management Cockpit, as well as Broadway IQ, a module that leverages real-time operational data to help improve advertising yields; supports advertiser demands for targeted spot placement and reporting transparency; Unsold Units Analysis dynamically analyzes potential revenue from unsold inventory; users can create multiple revenue scenarios based on different rate card and sellout assumptions.

616-454-4400
www.broadwaysystems.com
Booth: N3421

CAMERA DATA MANAGEMENT

MARVIN Technologies MARVIN 2.0



Automates the creation of backups, LTO tape masters, QuickTime proxies for offline editing and DVD dailies, as well as shot logging; new stereo 3-D support allows the system to ingest left- and right-eye images simultaneously, archiving to two LTO tapes — one for each eye; renders stereoscopic content to side-by-side, interleaved or checkerboard QuickTimes for Final Cut Pro or MXF files for fast import into Avid systems; available in 400GB, 800GB and 1.5TB per day configurations.

+44 1279 758285; www.marvintech.com
Booth: SL1716

HD LENS

Thales Angenieux 19 x 7.3 HD Video Lens

Offers precision optics and a focal range of 7.3mm to 139mm; weighs 4lbs with 2X extender; 19X zoom range allows close-up images with optimized definition and clarity; wide-angle capability is ideal for panoramic wide shots not possible with conventional ENG lenses.

973-812-4326; www.angenieux.com
Booth: C6037

PRE-TERMINATED WIRE ASSEMBLY

Optical Cable Corporation QuadBox

Pre-terminated 4-channel systems uses Keystone outlet jacks and bundled 4-pair cable; options include Cat 5e, 6, and 6a allowing multiple protocol options from 10Mb/s to 10Gb/s; each jack available in unshielded and shielded versions; each cable option available in CMR and CMP.

540-265-0690; www.occfiber.com
Booth: C10345

LOUDNESS PROCESSOR

Eyeheight KA-2

Hardware solution based on geNETics processor with KARMAudioRT allows real-time, unattended adaptive loudness and true-peak correction of stereo, 5.1-surround, dual-stereo or dual 5.1-surround audio; KARMAudioRT monitors the amplitude of incoming audio and makes gradual adjustments to ensure that content complies with predefined loudness targets.

623-328-5800; www.eyeheight.com
Booth: N3719

MONITORS

TV One LM-1920R, LM-1520R

Rack-mount housings tilt up or down to optimize viewing angle; high-brightness, active matrix LCD displays with wide viewing angles and excellent contrast ratios; two composite video (automatically terminated), one YC and three stereo audio inputs; HD-15 and DVI-D PC inputs can accommodate resolutions up to SXGA (LM-1920R) or XGA (LM-1520R); dual built-in speakers driven by two 1W amplifiers to provide stereo audio monitoring.

859-282-7303; www.tvone.com
Booth: C5647

TRANSMITTER/RECEIVER

Thinklogical SDI Xtreme 3G+



Designed for the transmission of 3G, HD and SD/HD-SDI signals with or without embedded audio and data; uses SFP duplex small-form-factor pluggable modules; offers broadcast-quality coax-to-fiber transmission from 3280ft up to 24mi via single- or multimode fiber optics; features advanced, integrated reclocking circuitry and equalized and redriven SDI loop through; transmitter options include dual channel, which provides two multiplexed signals transmitter and received over a single fiber.

203-647-8725; www.thinklogical.com
Booth: SL10023

BROADCAST MANAGEMENT SYSTEM

SintecMedia OnAir

Combines all major operations — including sales, traffic, programming, promo management and billing — into an integrated all-in-one system that facilitates communication across the organization, eliminates duplicate data entry and enables media companies to leverage their assets and airtime to increase profits; supports multiple channels, including complex network structures; configurable with an extensive customization toolkit.

917-606-5310; www.sintecmedia.com
Booth: N5315

RIEDEL

me



No one ever thinks about a broadcast signal. Until it isn't there.

Broadcasting sporting events and live news is anything but fun and games. When the eyes of the world are on a broadcast, viewers aren't thinking about the cables, the connectors, the reels or the broadcast infrastructure.

The need for performance is uncompromising. The ability to rapidly deploy, connect, and get up and running regardless of the weather conditions is critical. A million things can go wrong. Which is why OCC® is the right choice.



Our broad range of Fiber Optic Broadcast Cables are specifically designed for real-time transmission of high-definition broadcast signals. OCC's Field Broadcast cables are proven to repeatedly withstand the abuse associated with the extreme demands in rapid deployment and retrieval applications. And we've expanded our capacity to become a complete solution provider for cabling infrastructure for the broadcast industry.



OPTICAL CABLE CORPORATION

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occfiber.com/broadcast

CAMERA CRANE
Egripment TDT Encoding System



Tracking interface provides information obtained from all measured axes via a simple interface; position data is sent via Ethernet; multiple interfaced electronics can be operated on one network; tracking data can be integrated with the graphics software of leading manufacturers of virtual studio systems and graphics systems; gives existing owners of Egripment cranes the possibility to upgrade their crane arms.

818-787-4295; www.egripment.com
Booth: C8312

CLOUD-BASED MAM
Quantel QTube

Enables anyone involved with the production process, wherever they are in the world, to view, log and edit material itself located anywhere in the world; engineered to operate in the conditions provided by public Internet connections, where bandwidth, latency and availability are continuously variable; useable workflow will operate at bandwidths as low as 300kb/s and with latency in the range of hundreds of milliseconds.

212-944-6820; www.quantel.com
Booth: SL2014

QUALITY CONTROL SYSTEM
VidChecker VidChecker

Allows enormous QC processing throughput by using multiple processors and multiple cores on individual PCs; links many PCs to function as one giant QC system, automatically and transparently scheduling QC processing tasks; checks file, video and audio parameters but can also automatically apply intelligent automated correction to video levels that are out of specification; supports additional codecs, including VC1, DNxHD, ProRes, M-JPEG; multiple audio tracks each with up to eight channels can be checked in just one pass, and audio levels checked and automatically corrected to ITU-R BS.1770, ATSC A/85 and EBU R128 recommendations, including Tech 3341 audio loudness windowing and gating modes.

+44 117 959 6423; www.vidcheck.com
Booth: N3719-3

LOUDNESS MEASURING
Dolby Meter 2

Accurately and objectively measures loudness as viewers subjectively experience it; features include user-selectable algorithms, a high-quality peak limiter, level meters, a warning setting with a user-selectable function and threshold, and a real-time graphic function.

415-558-0200; www.dolby.com
Booth: SU3117

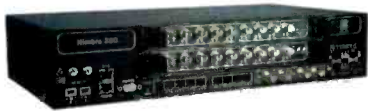
BROADCAST MONITORING SYSTEM Digital Nirvana MonitorIQ



Multichannel signal monitoring, logging, compliance, QC, archiving and content repurposing for TV; accepts HD/SD-SDI, ATSC/QAM, DVB-T/C/S2 or ASI, recording audio, video, VANC metadata and captioning in both full resolution HD and low-res; control is via Web or iPad interface, offering search functionality, cut/clip, and export to a wide range of file formats; now offers loudness monitoring and logging to the ITU BS.1770 standard.

510-226-9000; www.digital-nirvana.com
Booth: N3834

IP MEDIA GATEWAY Net Insight Nimbra 380



Provides full Ethernet switching capabilities between the eight physical ports and up to 119 logical ports (channels), including support for private line/LAN/tree services, to fit nearly all services carried over Ethernet; supports redundant power supplies, in-service hardware swap, various protection-switching mechanisms and extensive fault and performance monitoring; offers QoS with zero packet loss and the low jitter and wander, even at full network utilization; Ethernet, ASI, SDI, AES/EBU, E1/T1, DS3/E3 and STM-1 can be transported on the same platform.

866-217-9705; www.netinsight.net
Booth: SU3323

VIDEO ARCHIVING RECORDER FOR-A LTR-100HS

Features built-in LTO-5 drive with 1.5TB of recording capacity; can be used as a material/program exchange server; uses high-quality MPEG-2 codec with HD/SD-SDI I/O and MXF (OP-1a) wrapper/unwrapper; MXF files on LTO-5 tape can be used directly by other NLE systems.

714-894-3311; www.for-a.com
Booth: C5219

ENCODER/STREAMER Optibase MGW Micro Premium

Offers real-time, low-latency streaming of HD video sources or four SD video sources; supports built-in AES 256-bit encryption of video and data signals, KLV Metadata insertion, HD/SD-SDI, 3G, HDMI, DVI and composite inputs from a single unit; can be remotely managed via integrated HTTP interface or controlled by third-party applications with its developers' SDK.

800-451-5101; www.optibase.com
Booth: SL4508

SWITCHER/SCALER Analog Way Eikos



Offers up to 12 inputs, including four fitted with SDI and two fitted with DVI-D; outputs digital and analog signals in DVI and VGA (RGBHV) simultaneously with a selection of many formats from HDTV to computer 2K; offers three different operating modes: Multi Layer Mixer, 12 by 2 Seamless Native Matrix and QuadraVision modes; integrated audio stereo switcher features 12 inputs (eight analog and four from embedded SDI) and two outputs.

212-269-1902; www.analogway.com
Booth: SL1511

KVM EXTENSION SOLUTION Thinklogical Velocity T-4200



Supports two single-link DVI displays, PS2, full-duplex stereo audio and serial (RS-232); model options are either USB 1.0 HID (only) and/or USB 2.0 (up to 480Mb/s) device ports as well as a variety of video features, including dual link, RGB support and dual and single displays; allows users to locate DVI monitors and peripherals via fiber from just a few feet to up to 24mi away from the controlling computer securely without the loss of resolution or performance; provides hot-swappable, current-sharing power supply modules; can be configured as a transmitter, receiver or transceiver.

203-647-8725; www.thinklogical.com
Booth: SL10023

RIEDEL

in VEGAS

NAB Central Hall, Stand C6737

WHAT
WILL HAPPEN
IN VEGAS...
...WON'T STAY
IN VEGAS



Me_io_N_t C_m_c_

SOLID-STATE MEMORY CARD

Sony SR Memory

Compact and removable storage cartridge; guaranteed transfer rate of 5Gb/s; storage capacity comes in three sizes: 256G, 512G and 1TB; supports HD, 3-D and 4K recording, and multichannel high frame-rate recording; cards include data security features.

201-930-1000; sony.com/professional

Booth: C11001

ASI MODULE

JVC KA-AS790G



Provides a compressed MPEG-2 output, no additional encoding required; module attaches to the back of the GY-HM790U or GY-HM750U ProHD camera without external wiring or adapters; HD video and audio are compressed using the camera's built-in encoder (running at either 19.7Mb/s or 35Mb/s), which creates an MPEG-2 signal and then provides lossless transcoding to DVB-ASI; module outputs the live signal from the camera, even while recording, via a standard BNC connector; when the camera automatically detects the presence of the module, it switches to low-latency mode;

973-317-5000; pro.jvc.com

Booth: C4314

**AUDIO ROUTER
STAGETEC NEXUS**

Functions as an audio network, a router and an I/O matrix; offers audio format conversion, A/D and D/A converter systems, audio processing, data forwarding, routing interfaces, multichannel metering, power amplifier control, intercom; optical interconnections carry all audio and control data in a digital format; graphical control software application allows any input to be routed to the desired outputs.

888-782-4391; www.usa.stagetec.com

Booth: C2452

PTZ CAMERA

Vaddio ClearVIEW HD-20

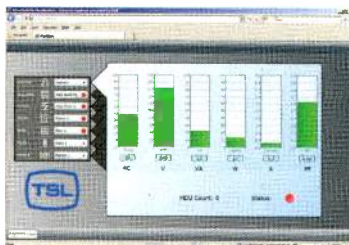
Features 20X multi-element motorized zoom lens; new slip-clutch robotics system enhances performance with smooth pan/tilt operation for accurate camera movement and control; HD resolution.

763-971-4400; www.vaddio.com

Booth: C8808

MONITORING SOFTWARE

TSL PsiMon



An SQL server-based system with a dashboard display that takes full advantage of the power distribution unit's many features; adds new "Blast" function that implements preconfigured power maps with a single button press; applications include managing energy consumption during out-of-hours work when the facility is not operational.

+44 1628 676 200; www.tsl.co.uk

Booth: N1119

AUDIO MIXERS

Lawo mc² series



Addition of loudness monitoring for each channel following EBU R128 and ATSC A/85 specifications, and based on ITU1770; metering is shown in the channel display and the GUI main display; a permanent display of the integrated measurements is provided within the GUI.

+49 7222 1002 0; www.lawo.de

Booth: C2628

COLOR CORRECTION SYSTEM

Blackmagic Design

DaVinci Resolve 7.1



Adds clustered multi-GPU processing to Mac OS X systems; improved support for Tangent Wave control panels; support for the JL Cooper Eclipse CX control panel; new file formats and codecs including support for Arri Alexa ARRIRAW, Phantom Cine, high dynamic range OpenEXR and more.

978-337-0991

www.blackmagic-design.com

Booth: SL220

AUTOMATIC CHANGEOVER MODULE

Neveion 3GHD-CHO



Intelligent changeover feature provides the ability to change input based on input signal loss, loss of lock, EDH errors or a combination of all three; offers media distribution for signal formats from 19.4Mb/s to 2970Mb/s in studio and broadcast applications; configurable for cable equalizing and re-clocking of DVB-ASI, SD-SDI, HD-SDI and 3G-SDI signal formats in a 1 x 8 or 1 x 6 distribution amplifier (DA); passive bypass function included with backplane board versions C2 and C4 enables full redundancy in case of main or card failure.

800-515-0811; www.neveion.com

Booth: SU7217

FORMAT CONVERTER

Doremi Labs Dimension3D

Converts any 3-D format to another including changing of the frame rates; allows for any 3-D input stream format to be used with all types of display components currently available; converts stereoscopic camera rig output to recorders and displays; encodes left- and right-eye streams into a single HD-SDI stream and back for recording 3-D content on standard HD tape and server technologies; USB connection provides for remote operation.

818-562-1101; www.doremilabs.com

Booth: C9515

InterBEE

International Broadcast Equipment Exhibition

2011.11.16 Wed. >>> 18 Fri. at Makuhari Messe, TOKYO

Now Accepting Applications

May 31st, Tuesday Primary Application Deadline

June 24th, Friday Secondary Applications Deadline

For Further Information:

InterBEE online
www.inter-bee.com

Professional Show for Audio, Video and Communications

Recognized as a professional show for audio, video and communications, InterBEE has established itself as an international exhibition showcasing top-level domestic and overseas broadcast, video, audio and lighting equipment as well as peripheral applications and solutions all under one roof.

Inter BEE 2011 Topics

- One of the biggest advanced technology exhibitions in Asia
- Showcasing various digital media technologies
- More professional core users from Asia and the world
- Communicating to the global market
- Creating new business opportunities

Inter BEE 2011 Exhibition Categories

Professional Audio Equipment Zone:

Audio Equipment

Professional Lighting Equipment Zone:

Lighting Equipment

Video and Broadcast Equipment Zone:

Production, Post-Production, Output and Transmission Systems, Broadcasting Equipment

Cross-media Zone:

IPTV, Mobile TV, Digital Signage, Digital Cinema, 3D Image, Digital Contents



2010 Review

A record high number of exhibitors

■ No. of exhibitors: record high

824 companies

■ News media representatives:

404 people

Visit of business-minded customers

■ Registered visitors:

31,567 people

70% or more are core customers

Organizer: **JEITA** Japan Electronics and Information Technology Industries Association

Global partners:  Asia Pacific Broadcasting Union

 IABM

 NABSHOW

 IB

 CCBM

 BIRTV

 KOBAL

 Broadcast Asia

 CASBAA

 Broadcast India 2011

 Hong Kong International Film & TV Market (FILMART)

Management /Contact : Japan Electronics Show Association

12F Ote Center Bldg., 1-1-3 Otemachi, Chiyoda-ku, Tokyo 100-0004 TEL:+81-3-6212-5231 FAX:+81-3-6212-5225 E-mail: contact@inter-bee.com

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**MULTICHANNEL HD VIDEO SERVER/
SYSTEM CONTROLLER
LEIGHTRONIX EMINENCE-HD2**



Features H.264 encode/decode hardware that delivers digital video images at low data rates; dual digital video channels operate as either encode or decode; includes built-in TV automation interface, HD-SDI video I/O with support for embedded audio, and highly compatible audio interface that supports direct connections for digital audio as well as balanced analog signals.

800-243-5589; www.leightronix.com
Booth: C9105

**INDOOR REMOTE-CONTROL
CAMERA
Canon BU-51H**



A new 2X digital extender doubles the image size of distant objects captured with the camera's 20X Canon HD zoom lens; includes a newly designed Night Mode feature that works by slowing down the shutter speed to a minimum of 1/4 (60i, 30F) or 1/3 (50i, 25F, 24F), allowing frame accumulation that elevates camera sensitivity; features a built-in mic with adjustable settings; designed for environments where quiet operation is essential; equipped with pan/tilt/zoom focus position information output for integration with virtual studio systems and other specialized applications.

516-328-5000; www.usa.canon.com
Booth: C4325

**CONTENT DISTRIBUTION
GlobeCast WorldTV**

Aggregates and distributes international content for all types of platforms, including DTH satellite, IPTV, cable and more; booth will feature a show reel of just some of the 170 channels in 35 languages being distributed by WorldTV.

212-332-2178; www.globecast.com
Booth: SU911

**MULTIVIEWER
Apantac TAHOMA-DE**

Supports up to eight high-resolution inputs in a single rack unit; allows users to customize their on-screen display of graphics, including borders, labels, fonts, tally LEDs, clock faces, logos, audio meters and A/V alarms; displays up to 16 audio meters per window; supports DVI/HDMI/VGA outputs at resolutions up to 2048 x 1080 (50Hz/60Hz), including support for 1080p.

503-616-3711; www.apantac.com
Booth: N2530

**IP-ENABLED PORTABLE SATELLITE
UPLINK TERMINAL
Vislink News and Entertainment
ADVENT NewsLite**



Portable, IP-enabled satcom terminal designed for use with current and new lightweight antenna systems; combines the performance of high-bandwidth broadcast contribution feeds with the flexibility of BGAN-type newsgathering and creates new remote connectivity applications; design is IATA weight-compliant for airport baggage handling; modular electronics support a broad range of satellite antennas.

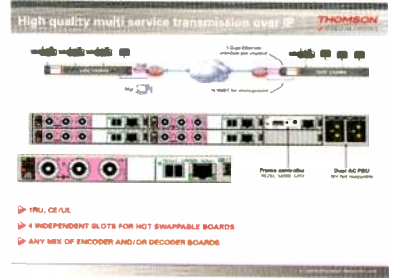
978-671-5700; www.vislink.com
Booth: C6019

**STUDIO CONDENSER MICROPHONE
Sennheiser MK 4**

Features a lin condenser capsule, optimized for project studio and home studio applications; designed to provide maximum sound quality at a competitive price point; additional features include a 24-carat gold-plated diaphragm, full metal housing, and low inherent self-noise and high maximum SPL; is capsule shock-mounted internally to minimize structure-born noise.

860-434-9190; www.sennheiserusa.com
Booth: C2055

**IP TRANSMISSION SYSTEM
Thomson Video Networks
ViBE VA5004**



Features modular chassis with dual power supplies and four slots for any combination of encoding or decoding hot-swappable modules; includes JPEG 2000 compression for high-quality SD, HD or 3G transmission over IP links; requires only 150Mb/s for one HD channel or 40Mb/s for one SD channel; combines low latency and excellent AV synchronization with powerful tools for IP transmission error correction, advanced clock recovery and jitter removal.

+33 2 99 27 30 30
www.thomson-networks.com
Booth: SU4917

**LOGGING TOOL
Blue Lucy Media Miura File Logger**



Designed to enable metadata to be easily appended to file-based content using configurable templates; operators can review media in real time, including the playback and review of Windows Media files, while the ingest process is ongoing and add metadata as required; results in metadata text delineated by time code that is then easily stored in a MAM system for later use.

+44 7802204373
www.emotion-systems.com
Booth: N3719-D

**TEST CHART
DSC Labs Pilot 3D Chart**

Features runway-like extension and corner LED lights; offers neutral grayscales, accurate color bar patches and zone plates, camera synchronization, multiple scales, geometric webs, and 18 percent gray patches, ensuring critical precision.

866-372-5227; www.dsclabs.com
Booth: C10215

Good things come to those who wait...



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BOOTH # SU4905**

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- ▲ Better Multiplexing!
- ▲ Better Encoding!
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MONITORS

**TVLogic TDM-243W;
TDM-473W 2D/3D**

TDM-243W (24in) and TDM-473W (47in) 2D/3D LCD broadcast monitors feature a micro-polarizing filter attached to the LCD panel in concert with polarizing 3-D glasses for seamless 2D or 3-D viewing of one or multiple monitors; full 12-bit processing delivers smooth greyscale and color transitions; can accept multiple 3-D signal formats (3G, dual link L/R, field sequential and side-by-side HD-SDI).

818-567-4900; www.tvlogicusa.com

Booth: SL1526

B4 MOUNT ZOOM LENS

Fujinon XA20sx8.5 BRM

20X zoom for 2/3in cameras; focal length of 8.5mm to 170mm; maximum relative apertures of 1:1.8 (8.5-113 mm) and 1:2.7 (170 mm); features QuickZoom, Innerfocus, and Digital Servo.

973-686-2405; www.fujinon

Booth: C7525

BROADCAST MANAGEMENT SYSTEM

**Myers Information Systems
ProTrack TV**



Integrates seamlessly with existing infrastructures such as automation, archive, accounting, PSIP and Web distribution platforms to optimize workflow efficiency and preserve current investments; cross-platform sales environment enables for unified contracts, invoices and affidavits across the entire range of station media offerings; provides accurate forecasting, availability monitoring, sophisticated spot placement and a full array of yield management reporting.

413-585-9820; www.myersinfosys.com

Booth: N3434

PRODUCTION SWITCHER

Vaddio ProductionVIEW MV

HD/DVI-HDMI production switcher features integrated camera controller and multiviewer; touchscreen control panel allows production operators to see and switch all live video feeds and create "video thumbnails" of preset camera shots; comes in two sizes, an 18.5in rack-mount style or a standard 22in screen.

763-971-4400; www.vaddio.com

Booth: C8808



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N2530

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- ▶ Auto-Detects 4-32 Inputs / Sources
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- ▶ Embedded & discrete audio monitoring
- ▶ Multiple outputs: DVI, HDMI, VGA, SDI
- ▶ Skin Technology for customizable user interface
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TAHOMA-LX Multiviewers

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TAHOMA-LI Multiviewers

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Euromedia OB Van740 with APANTAC Multiviewers



www.apantac.com

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VIDEO-OVER-IP MONITOR**Nevion FCS250-IP**

Compact, high-density video in-service monitor for video over IP that installs in any Ventura chassis; provides full monitoring of integrity, presence and activity on each channel; allows users to pinpoint QoS issues along the transport path and proactively correct problems; provides automated SLA compliance monitoring, a built-in Web interface for monitoring and configuration, and SNMP and XML for remote access and reporting; performs wire-speed monitoring of up to 512 IP flows on an electrical or optical network interface at the Ethernet, IP, UDP and RTP layers, as well as the monitoring of different formats.

800-515-0811; www.nevion.com
Booth: SU7217

3-D MASTERING SYSTEM**Dashwood Cinema Solutions Stereo3D Toolbox v3.0**

Outputs media to a wide range of stereoscopic 3-D formats and manages the demuxing of side-by-side, interlace and over/under formatting; capabilities include subpixel precision, pixel-precise straight or angled floating windows, high-contrast "ghost toasting," intuitive preview tools, fine control of image exposure and color balance, and 2D+Z-depth-to-stereoscopic conversion.

413-374-7655; www.dashwood3d.com
Booth: C10514D3

LOCATION LIGHTING**Photon Beard Nova Spot**

Power consumption is 273W and can be powered by mains or battery; no fans required; daylight color temperature with near continuous spectrum; produces similar amounts of light as a 2000W tungsten Fresnel.

+44 1525 850911; www.photonbeard.com
Booth: C3346

MULTIVIEWERS**Snell M7-Series**

Designed for a range of applications, including control rooms, studios and OB trucks; accepts up to 64 video inputs, in a range of analog and digital formats including 1080p, which are complemented by audio metering and monitoring of up to 16 channels per tile; other audio monitoring enhancements include the ability to monitor discrete AES, analog audio or Dolby AC3 inputs.

212-481-2416; www.snellgroup.com
Booth: N1820



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IP TRANSPORT STREAM MONITORING SYSTEM
DVEO Q Check/IP



Developed to automate monitoring and error diagnosis at digital headends at both teleports and cable system master control rooms; supports most broadcast video compression standards and video and audio formats; provides a real-time overview of multiple services coming from multiple transport streams; accepts 10 to 40 or more services: DVB-ASI or IP transport streams (SD/HD, MPEG-2/H.264), subtitles, images, etc.

858-613-1818; www.dveo.com
Booth: SU6911

CAMERA-MOUNTED STORAGE
Sony portable solid-state recorder

Multipurpose field recorder; DC-powered; fits onto standard camera battery mounts; provides HD-SDI 1.5G/3G dual link connectivity; formats include 1080/24p@60p RGB or 1080 30p/60i@4:2:2 3-D; handles timecode in/out.

201-930-1000; sony.com/professional
Booth: C11001

DIGITAL HDTV PORTABLE CAMERA SYSTEM
Ikegami HDK-77EX

Designed for 1080i HD production applications; employs three 2/3in, 2.2-million-pixel IT CCDs, 14-bit A/D converters and Ikegami's Chip C4 advanced digital signal processing ASIC; offers advanced network control features that can enable video operators to adjust and shade cameras from virtually any location; can be used with 9in LCD 16:9 HD or 5in CRT viewfinder for traditional studio HD camera configuration.

201-368-9171; www.ikegami.com
Booth: C5108

ENCODER
Haivision Makito



Designed to offer efficient and affordable distribution, capture and rebroadcast of HD video; combines the efficiencies of H.264 video compression and the image quality of full HD video within a very small form factor; recently upgraded to revision 1.5; now supports CBR encoding to assure transport and systemwide compatibilities and, optionally, real-time metadata capabilities; provides H.264 encoding at up to 1080p60 with the lowest available end-to-end latencies.

877-224-5445; www.haivision.com
Booth: SL9112

AC POWER CONNECTOR
Neutrik powerCON TRUE1

Designed for 16A, 250V; features IEC 60320 breaking supply, and inlet and outlet couplers for easy daisy-chaining of equipment; provides for high-density requirements with a duplex chassis connector; available for self-termination or as a ready-made cord set; the cord set, with over-molded cable connectors, offers protection class IP65 in the mated condition.

704-972-3030; www.neutrik.com
Booth: C8137

VIDEO-OVER-IP GATEWAY
Artel Video Systems DLC410



An ASI- and SDI-over-IP gateway that enables the transport of two bidirectional streams across a single Gig-E connection; includes multicasting, making it suitable for CATV operators and video service providers with inter-city video connectivity requirements; design based on the SMPTE 2022 encapsulation and forward error correction standard provides interoperability with other standards-based VOIP products.

978-263-5775; www.artel.com
Booth: N6129

Pandora

GET A HANDLE ON YOUR LOUDNESS BEFORE IT'S OUT OF THE BOX



With a price right for everyone in the production chain, Pandora helps you keep loudness contained before it's ever a problem.

Monitors and logs up to 8 channels of SDI or AES audio <<
One-button setup supports both ATSC and EBU standards <<
Easy to use iPod touch based interface <<

Unleash Pandora for yourself at NAB 2011, #N2524



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www.wohler.com

CAPTIONING
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LOUDNESS

VIDEO PRODUCTION SYSTEM
Broadcast Pix Granite v1.3



Adds Fluent Clip Store, which holds up to 120 hours of HD clips and supports 1920 x 1080 MOV and MP4 files; provides stereo audio output for both Fluent Clip Store and Animation Store through XLR connectors; clips can be instantly accessed from the control panel with file names displayed on the PixButtons; can store up to 2TB of clips, animations and graphics; available in a RAID array.

978-600-1100; www.broadcastpix.com
Booth: N4506

ANTENNA
SPX Communication
Technology DCR-XL

1kW power rating; low-power FM antenna is designed to be competitively priced for both domestic and international low-power markets; ideal for small market stations, auxiliary antennas and college stations.

207-655-8100; www.spxcomtech.com
Booth: C2222

MANAGEMENT SYSTEM
Obor Digital Zeus Broadcast

Manages the service department; provides help desk communications; tracks all asset activities, changes and configurations; handles multiorganizational, multilocation or multigroup topologies; provides fully searchable and sharable information while maintaining the separation and control that each organization, location or group requires.

407-352-6501; www.zeusbroadcast.com
Booth: N705

DUAL-CONCENTRIC ENCODER
Elma Electronic Type E37



Features a dual-concentric inner shaft and outer pole (allowing it to act as two encoders), threaded or nonthreaded bushing, vertical or horizontal mounting, various shaft dimension and shape possibilities, operating temperature range of negative 40 degrees to 85 degrees Celsius, and a rotational life of up to 1 million revolutions; comes with 16 or 32 indents in standard resolution and an optional integrated push button and IP68 front-panel sealing; includes a rugged metal housing and shaft; enables the user to change channels or frequencies in precise intervals without having to look at the switch indicator.

510-656-3400; www.elma.com
Booth: C8228

BATTERY CHARGER
PAG RM34X



Can be used to simultaneously fast-charge lithium-ion batteries manufactured by PAG, Sony or IDX, via four V-Mount or PAGlok battery mounts that connect to the charger via its four XLR-4 outputs; designed to be mounted in a half-width racking system; measures 1U high; output of about 100W (6A at 16.8V); all stages of the charging process are indicated on the unit's backlit LCD screen.

+44 20 8543 3131; www.paguk.com
Booth: C9921

TAPE STORAGE SYSTEM
Small Tree GraniteSTOR Archive

Features LTO-5 tape technology capable of storing up to 3TB per cartridge, all over Ethernet; achieves data transfer rates up to 1TB/hour performance by matching speed of the host to keep drives streaming while maintaining data integrity to and from the RAID array; designed to reduce editing downtime for Final Cut and Pro Tools users while providing a safe and reliable method for safeguarding content.

651-389-9950; www.small-tree.com
Booth: SL10505

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AMP2-16V

JUST BECAUSE IT'S THE BEST, DOESN'T MEAN WE CAN'T MAKE IT BETTER.

SMPT2020, new I/O and a even easier, more powerful interface are just a few new additions. Because 16 channels, industry awards, audio mixing and routing aren't enough for us.

Take the next step with the 16V at NAB, #N2524

Use two OLED screens to monitor any combc of video, audio metadata « Hotkeys can recall presets, assign I/O, mix audio, switch to Dolby® analysis « Modular I/O available with SDI, analog, AES, Dolby, and TOSLINK «



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info@wohler.com



AUDIO

www.wohler.com



CAPTIONING

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LOUDNESS

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VIRTUAL SET EDITOR
NewTek TriCaster Virtual Set Editor (VSE)

Allows TriCaster TCXD850 and TriCaster TCXD300 users to customize specially designed TriCaster VSE sets to fit their production needs; VSE Sets produce real-time reflections and specular highlights, and provide users with a wide range of elements that they can edit; users can also add their own artwork to Layer Sets to create custom virtual sets for use in VSE; once a TriCaster VSE Set has been customized with Virtual Set Editor, users can export it for immediate use in their TriCaster live production.

210-370-8000; www.newtek.com
Booth: SL4514

FRAME SYNC AND CONVERTER
AJA Video FS1



Simultaneously works with both HD and SD video in 10-bit broadcast-quality video and 24-bit audio; supports eight-channel AES, balanced analog, or embedded audio with full flexibility and audio processing controls; supports closed captioning and the conversion of closed captioning between SD and HD formats, including full conversion of CEA-608 captions to the CEA-708 standard; supports Web-based and SNMP remote control.

530-274-2048; www.aja.com
Booth: SL4420

AUTOMATION PLATFORM
SGT VEDA Automation



A flexible platform to manage payout; comes with an automation server and an entirely new customizable interface; provides versatile playlist editing, multichannel playlist viewer, content management, drag and drop playlist management, actionable playlist preview, and frame-accurate browsing.

+33 164 73 74 74; www.sgt.eu
Booth: N1402

ADVERTISING
AUTOMATION SYSTEM
ProConsultant Informatique CINDY

Offers the full range of account management, automated and manual scheduling, invoicing, and financial reporting; new version extends these capabilities to new media environments, adding the ability to target advertising in nonlinear programming; includes automated invoicing of nonlinear advertising; can operate as a stand-alone application or be integrated with other advertising systems and databases.

404-920-0786; www.proconsultant.net
Booth: N5812

SOLID-STATE RECORDER
Sony SR Memory Deck

Multichannel solid-state recorder includes four input slots for SR memory cards and four configurable I/O ports; supports HD, 3-D and 4K resolutions, MPEG-4 SStP, uncompressed DPX operation, and 16 channels of 24-bit PCM audio; each HD video channel is 3G SDI dual-link capable; internal memory capacity is 8TB, providing a total storage capacity of 12TB (100hr of SR-Lite material).

201-930-1000; sony.com/professional
Booth: C11001

ROUTER
Evertz EQX

Can route up to 576 x 576 signals in a 26RU frame, or up to 288 x 288 in the 16RU frame; supports signals from 3Mb/s all the way up to 3Gb/s, including SD-SDI, HD-SDI, DVB-ASI and SMPTE 310M digital video formats, as well as optical formats and other high-data-rate signals; provides extensive signal monitoring of both inputs and outputs, power supply voltages, interior temperatures and fan speeds; all monitored data is available through SNMP for facilitywide monitoring systems.

905-335-3701; www.evertz.com
Booths: N1602, SU4307



MADI-8

64 CHANNELS OF AUDIO AT THE TWIST OF A KNOB

There are a lot of MADI products out there. Only one actually lets you monitor your MADI, right in the rack. Introducing the MADI-8.

In-rack MADI monitoring debuts at NAB, #N2524

Monitor any 8 channels at a time from coax or optical inputs «
Name channels and save presets for instant recall «





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AUDIO
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CAPTIONING
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LOUDNESS

MULTIVIEWER
Avitech International Rainier-3G



Features eight HD looped inputs and an internal cascade architecture allowing for output to two monitors; six modules can be cascaded together, allowing for the display of up to 48 HD/SD-SDI inputs; 1RU size; draws less than 60W.

425-885-3863; www.avitechvideo.com
Booth: SL9120

VIDEO CONVERTER
TV One C2-2375A



Provides up/down/crossconversion; inputs and outputs can be SD/HD/3G-SDI, DVI, composite video, YC, YUV, YPbPr or RGB; one SD/HD/3G-SDI input with re-clocked out; digital/analog inputs include two DVI-U (DVI, analog RGB/YPbPr/YUV/CV/YC); one tri/bi with loop-through genlock input; two SD/HD/3G-SDI outputs (duplicated); two DVI-U (DVI, analog RGB/YPbPr/YUV/CV/YC) digital/analog outputs, and the second digital/analog output can be a different format; supports NTSC, PAL-M, PAL-N and SECAM.

859-282-7303; www.tvone.com
Booth: C5647

MASTER CONTROL SWITCHER
Utah Scientific MC-4000



Integrated system for handling the most demanding on-air operations in live, automated or automation-assisted operating environments; offers built-in capabilities to handle all of the most commonly required on-air operations, including still and animated logo presentations, audio and video clip playback, and foolproof EAS message presentation; features new internal squeeze and graphics capabilities.

801-575-8801; www.utahscientific.com
Booth: N4511

CONTENT MANAGEMENT
Signiant Media Exchange

Browser-based application enables IT and non-IT managers and staff to send content bigger than e-mail can handle to where it needs to be faster and more easily than before; users can exchange content with others, regardless of location and size of digital assets; media and project files can be moved across WAN, DSL or cable; new notification features allow users to track workflow benchmarks, confirmations and alerts for other departments.

781-221-4000; www.signiant.com
Booth: SL5229

DISTORTION ANALYSIS SOFTWARE
Rohde & Schwarz R&S FS-K130PC

Allows users to characterize and linearize amplifiers; compensates for memory effects exhibited by many of today's amplifiers; test setup consists of a spectrum analyzer, a signal generator and a PC; measures the amplifier's characteristics and calculates the correction required to attain a linear output signal.

410-910-7800; www.rohde-schwarz.com
Booth: SU3721

OPTICAL VIDEO DISTRIBUTION CARD
Norwia DC-4B-SDI

A 3G-SDI optical video distribution card that can be populated with Norwia SFPs from one to four channels as user need expand; one card can be used for transmit, receive or both; provides transmit and receive functionality depending on the optics inserted; Flexi I/O redistributes I/O functionality when it is needed.

+47 97 19 82 93; www.norwia.no
Booth: N829



Presto

GET IN TOUCH WITH YOUR VIDEO

The Presto is a 16x1 3G switcher that ingeniously puts video screens in every button, so you'll never have to cross your fingers again.

See Presto work its magic at NAB, #N2524

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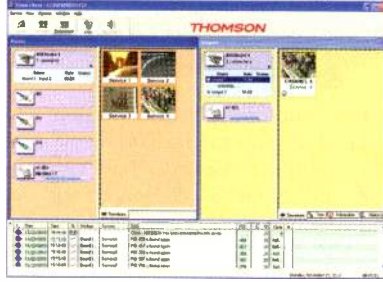
MOBILE AND STUDIO GATEWAYS
Vislink News and Entertainment
AMG/ASG2100



Enables file-based workflow to and from the field by providing mobile IP routing and wide-area connectivity between the studio and remote ENG/OB resources; always-on connectivity to the OB system allows remote control and monitoring of the OB equipment, allowing engineers in the studio to configure or diagnose any issues occurring in the field from the studio; AMG2100 unit maintains mobile data connectivity over 3G/4G/WiMax cellular networks.

978-671-5700; www.vislink.com
Booth: C6019

MPEG BROADCAST SERVER
Thomson Video Networks Sapphire



Channel-in-a-box solution with advanced capture, playout and regionalization capabilities operates frame-accurately in the compressed domain; provides all the functions needed to ingest, process, brand and generate TV channels ready for air; includes frame-accurate clip editing enhancements, advanced logo insertion features (with support for H.264 and new scheduling capabilities) and BFX support.

+33 2 99 27 30 30
www.thomson-networks.com
Booth: SU4917

VIDEO SERVER
QTV/Autocue Autocue Video Server



Linux-based video server previously sold as part of an end-to-end newsroom and production system is now available as a stand-alone product; features bidirectional HD/SD ports, a range of storage capacities and a dedicated user interface; supports a range of capture and playback formats, including DV, DVCPRO25/50/100, MPEG-2 and MPEG-4; both analog and digital connections are available and a range of additional features can be added, including creating a sequence of clips for playback; can be used as a VTR replacement, a simple network storage device or a more traditional video server.

212-929-7755; www.autocue.com
Booth: C8525



opticalCON | fiber optic connection system



Rugged and waterproof fiber optic connection system | Automatic sealing shutter for dust protection | Based on LC connectors - field repairable | On air monitoring of fiber optic transmission quality | 2, 4, and 12 fiber solutions | World wide short-time availability.

www.neutrik.com

NEUTRIK

CAMERA TROLLEY SYSTEM

Telemetrics TG3

Features a redesigned low-profile trolley and track, which minimizes space requirements; constructed of lightweight aluminum components and steel rods for bearing contact; trolley is a fixed platform with straight-track operation only; rigid design provides increased stability and can be mounted on the floor or ceiling; provides accurate preset positioning and repeatable motion; available with custom track lengths and cable management systems.

201-848-9818; www.telemetricsinc.com

Booth: C9529

TESTING MONITOR

Atlona Technologies AT-DIS7-PROHD



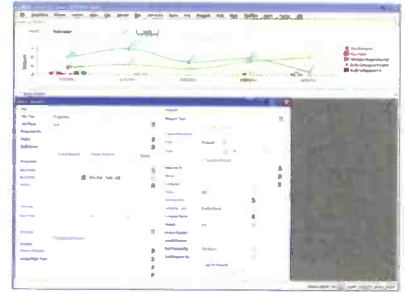
7in testing monitor designed for those looking to test cabling and installation of different components; portable display recognizes any HDMI, DVI, VGA or component video source at resolutions up to 1080p or 1920 x 1200 (including a huge variety of other HDTV and computer resolutions); allows integrators to observe both audio and video signals in real time; can also be used to test 3-D sources.

408-962-0515; www.atlona.com

Booth: SL7706

MANAGEMENT TOOL

Pilat Media IBMS Performance Dashboard



Operational tool ties together workflow processes and business information to monitor and display the status of a large number of business processes; at-a-glance visuals and graphic displays quickly and efficiently highlight exceptions and alert key business executives to items needing attention.

+972 3 5775080; www.pilatmedia.com

Booth: N4429

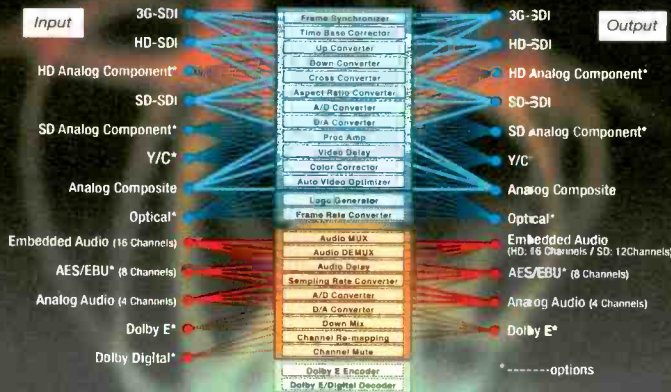
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New FA-9500 Multi-purpose Signal Processor

The Future of Frame Synchronization



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and AUDIO TECHNOLOGY



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- Separate cross/down conversion output
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- USA Southern (FL) Tel: +1 305-931-1700
- Latin America & Caribbean (FL) Tel: +1 305-931-1700
- Canada (Toronto) Tel: +1 416-977-0343

Continuous Innovation

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AUTOMATION SYSTEM
CISTECH iAutomation



Maximizes interface with any device through a three-tier diversified environment; provides device, signal and network backup; features multichannel payout, flexibility in system expansion, redundancy, frame accuracy with real-time embedded O/S, powerful user interface, simplicity in processing events, dynamic device allocation and management, and integrated ingest features.

+82 221 068 540; www.cistch.com
Booth: SL9109

HD TRANSMITTER
Broadcast Microwave Services
UL5820TX-HD



Features low power consumption, one-frame latency, COFDM 2K transmission, 100mW operation, 8MHz bandwidth, rugged, lightweight design and frequency range of 5.725GHz to 5.875GHz, with other frequencies upon request.

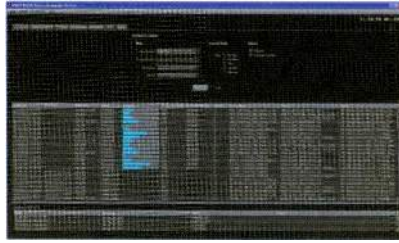
858-391-3050
www.broadcastmicrowave.com
Booth: C4837

OPTICAL VIDEO DISTRIBUTION HUB
Norwia miniHUB

Includes control functionality into the frame as standard issue; provides monitoring and control functions via a Web interface; "click and go" card locking system allows for positive locking of cards without the need for screws, springs or locking panels; IRU chassis.

+47 97 19 82 93; www.norwia.no
Booth: N829

TRANSCODING SOFTWARE
Digital Rapids Transcode
Manager 2.0



Features new dynamic workflow capabilities and extends scalability within facilities and beyond; provides efficient management, automation and performance for media transformation between acquisition, production, archive and distribution formats; supports multiscreen distribution opportunities with output format support for viewing platforms from mobile phones and tablets to game consoles and connected TVs.

905-946-9666; www.digital-rapids.com
Booth: SL6010

SCAN CONVERTER
Matrox Convert DVI Plus



Creates broadcast video from computer applications such as Skype, YouTube, Google Earth, video games, and web browser sessions, as well as citizen journalists' mobile phone videos; DVI-D input up to 1920 x 1200; HD/SD-SDI digital output; HD/SD analog component, S-video, and composite analog inputs; SD analog black burst (bilevel) or HD trilevel genlock with timing offset controls; simultaneous analog and digital video output; stereo audio input can be embedded into the SDI output signal; real-time hardware upscaling and downscaling with proper color space and aspect ratio conversion.

800-361-4903; www.matrox.com
Booth: SL2515

SOFTWARE CALIBRATION/ANALYSIS SYSTEM
Dashwood Cinema Solutions Stereo3D CAT

Simplifies the calibration of left- and right-eye cameras; scans 3-D footage and calculates the correct camera alignment points; feedback guides illustrate the depth of the 3-D shot and provide directors and cinematographers with a visual aid for making convergence adjustments and proper interaxial separation; supports all 3-D single or dual input and output modes, flip/flop left- and/or right-eye orientation, automatic or manual disparity correction, and HIT convergence adjustment with automatic scaling.

413-374-7655; www.dashwood3d.com
Booth: C10514D3

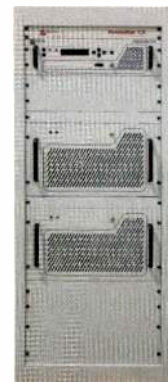
COMPUTER GRAPHICS SOFTWARE
NewTek LightWave 10



Gives artists ability to interact directly in the viewport and see changes to lights, textures, volumetrics and more, to view updates to their stereoscopic work in real time, and to deliver realistic environment walkthroughs; data interchange tools enhance pipeline integration; new user interface.

210-370-8000; www.newtek.com
Booth: SL4514

TRANSMITTER/TRANSLATOR
Axcera Innovator CX



Feature-rich, compact, air-cooled UHF TV transmitter, translator and echo-canceling gap filler/repeater offers a high level of performance and reliability; available for most any current analog or digital standard, including ATSC, DVB-T/T2/H/SH, ISDB-T/Tb and more.

800-215-2614; www.axcera.com
Booth: SU2908



The AMOS-5 Satellite is Coming to Africa



Spacecom is expanding coverage to the farthest reaches of Africa with the launch of the AMOS-5 satellite in the third quarter of 2011.

Located at the 17°E orbital position, the AMOS-5 satellite will offer enhanced capabilities, expanded coverage areas and high-power C-band and Ku-band capacity throughout the African continent.

Spacecom has long served the U.S. DoD through its systems integrator partners. And, thanks to the AMOS-5 satellite, we will soon be able to meet the burgeoning satellite connectivity needs of a variety of fast growing vertical markets across Africa like the oil and gas industry.

Additionally, Spacecom serves Direct-To-Home (DTH) platforms in Europe and the Middle East, TV broadcasters and programmers, government organizations, VSAT service providers and telephony operators.

With AMOS-2 and AMOS-3 at the 4°W orbital "Hot Spot" for European and Middle Eastern coverage, AMOS-4 launching in 2012 to serve Asia, and AMOS-6 in 2014, the AMOS satellite fleet is perfectly positioned for performance.

Pan-African C-band and Ku-band capacity on AMOS-5 is now selling.

Contact us to find out more.

AMOS
by Spacecom

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Visit us at: Satellite 2011 • March 15 – 17 • Washington, DC • Booth #675

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AUXILIARY POWER ADAPTER
Brick House Video Video Ghost



Provides switchable 5V or 12V auxiliary power for camera accessories using the existing video cable; under certain conditions a 656ft operating length is achievable.

+44 1962 777733
www.brickhousevideo.com
Booth: N6531

TAPE MIGRATION SYSTEM
Front Porch Digital SAMMArobot



Provides up to 1000 hours a week of videotape content conversion; loaded with batches of between 48 and 80 videotapes, depending on the format, and migrates up to seven tapes simultaneously — each with their own settings for error detection and multiple digital file outputs; system can be configured as a single-format solution for 60 Betacam or VHS, 48 U-matic or 80 DVCAM/DVCPRO cassettes handling NTSC, PAL or SECAM.

303-440-7930; www.fpdigital.com
Booth: N5806

CAPTION LEGALIZER
EEG MPEG-2 Caption Legalizer

Designed specifically for batch-based compressed file workflow; ensures captioned video assets are in full compliance with CEA-708, ATSC and CableLabs standards; processes HD MPEG streams at rates of 15X real time, enabling quick standardization and full quality control for VOD libraries and other high-throughput post-production and distribution workflows.

516-293-7472; www.eegent.com
Booth: N4029

METADATA PLATFORM
Triveni Digital StreamScope
MT-40 4.6



Provides end-to-end MPEG-2/MPEG-4 transport stream analysis and monitoring for DTV services carried by broadcast, cable, satellite, IPTV or mobile networks; while the MT-40 already offers monitoring capabilities including dialnorm, the new software release extends these capabilities by allowing users to monitor audio loudness according to ITU-R Recommendation BS.1770 (as required by A/85) and, in turn, meet the requirements of the CALM Act.

609-716-3500; www.trivenidigital.com
Booth: SU3202

TRAFFIC REPORTING SYSTEM
Beat the Traffic Beat the Traffic 3D



Integrates real-time traffic data for main and arterial roads; displays live streaming video feeds directly into its 3D maps, enabling reporters to illustrate their reports with live video footage from actual traffic locations; facilitates the setup of traffic reports ready for air in a matter of seconds; features 3D graphics, familiar landmark icons and fly-through transitions; available in SD or HD; provides simple ways to add custom elements for branding and sponsorships.

408-777-6601; www.beatthetraffic.com
Booth: SU2302

MULTIVIEWER
Avitech International Sequoia 4H



Allows up to four HDMI inputs and one HDMI output; standalone multiviewer integrated with a switching function for keyboard/mouse, USB hub, speakers and microphone.

425-885-3863; www.avitechvideo.com
Booth: SL9120

VIDEO CAPTURE CARD
ViewCast Osprey 710e HD

Includes AES digital audio; high-powered PCI Express (PCIe) technology for maximum performance; acceptance of both SD and HD inputs; automatic adaptation between SD and HD signals; on-the-fly HD-to-SD downscaling; low-profile architecture for form-factor constrained environments; professional broadcasting features, such as loss of video detection, color space conversion, automatic telecine detection and processing, and automatic optimization for changing motion content; comes with premium driver that provides the ability to generate multiple simultaneous streams from single video input.

800-540-4119; www.viewcast.com
Booth: SL5010

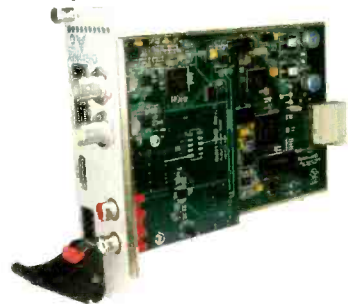
AUDIO LOUDNESS ANALYZER
Emotion Systems Emotion File Finish



Automatically analyzes and fixes audio loudness violations in file-based media; ensures compliance with latest ITU-R BS.1770, BS.1771 and EBU R128 standards; uses accurate modeling of analog peak program meters and loudness detection parameters.

+44 7802204373
www.emotion-systems.com
Booth: N3719-D

IPTV ENCODER
Visionary Solutions AVN Series



New order fulfillment scheme enables the customization of AVN series encoders, providing greater flexibility and cost-effectiveness for many IP streaming applications; firmware gives users the flexibility to upgrade as needed; adds H.264-over-IP encoding at full 1080p60 in the AVN443, AVN441 and AVN422 modules.

805-566-5811; www.vsicam.com
Booth: SU5602

CONNECTORS
Fischer Connectors UltiMate Original Series

Includes four mechanical codings and visual coding to prevent misconnection; push-pull connector is available in a wide range of body styles, sizes and configurations including multipole contacts from 2 to 42 poles; IP68/69K sealed even unmated, tested according to IEC norm 60529; withstands temperature fluctuations from -55°C to 135°C.

678-393-5400
www.fischerconnectors.com
Booth: C10948

STORAGE PLATFORM
SAN Solutions ArtiSAN 5400 series

Designed for high-capacity requirements; holds 192TB of 2K/4K content, as well as all types of video media, including HD and 3D material; is offered in a 2RU, 12-bay, 3.5in drive enclosure form factor; comes standard with SAN Solutions' dual active RAID controller; point in time volume images, remote volume mirroring and replication services are optional features in this product series, enabling an effective disaster recovery storage implementation.

866-661-7144; www.sansolutions.com
Booth: SU3725

AUTOMATED SUBTITLING CONTROL CENTER
Softel ScheduleSmart

Workflow technology uses proprietary heuristics and algorithms to determine the optimum point in the workflow at which to bind captions, subtitles and ancillary data to content; automatically assesses whether there is time to ingest data to media servers or a digital asset management system; if the system determines early or late binding is not possible, live systems are automatically directed to perform the bind at time-of-air.

+44 118 984 2151; www.softelgroup.com
Booth: N5829

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ENCODER
Digital Rapids StreamZ Live IP



Supports single- or multiprogram transport stream inputs with H.264 or MPEG-2 compressed video; features the same flexible output capabilities as StreamZHD Live ABR adaptive streaming encoder for reaching devices from mobile phones and tablets to PCs and connected TVs; can be combined with Digital Rapids Broadcast Manager software for enterprise-class management, automation, monitoring and failover.

905-946-9666; www.digital-rapids.com
Booth: **SL6010**

RECEIVER DECODER
Sencore MRD 3187B



Adapts to almost any contribution, distribution or backhaul environment; new features include IP turn-around configurations, PID filtering and DVB-S2 / ISSY support; other important features include SCTE-35 to SCTE-104 DPI message conversion for commercial insertion applications, DVB-Common Interface for conditional access, multiservice descrambling, and advanced DVB-S2 capabilities such as 16ASPK and VCM support.

605-335-6379; www.sencore.com
Booth: **SU7213**

UNIVERSAL MEDIA READER/WRITER
Sonnet Technologies Qio



Professional universal media reader/writer is designed to be a convenient and cost-effective alternative to standalone card readers; features dual P2, SxS and CompactFlash slots; can transfer data from two cards concurrently, enabling users to offload files more quickly and efficiently; an included adapter handles SDXC cards; moves files between any cards, attached drives or host computer with aggregate bandwidth up to 200MB/s.

949-587-3500; www.sonnettech.com
Booth: **SL9605**

TRANSMITTER
Screen Service Broadcasting Technologies SDT Ark 6 Series

Can be used as a transmitter, a heterodyne transposer, a regenerative transmitter and single frequency echo canceller; implements DVB-T/T2, PAL, ATSC/MH, NTSC and ISDB-T modulations; allows selection of transmission modes in various ways: remotely, using a dry contact, via SNMP commands, via TCP/IP using the Web graphic interface, or even via a dedicated command inserted into the transport stream.

888-522-0012; www.screenservice.net
Booths: **SU6321, OE1371**

INTEGRATED RF RECEIVER/TRANSCODER
DVEO MPEG Gearbox RF/IP



Designed to receive satellite and terrestrial RF signals and transform them into streams that are best-suited for customers; relies on an Intel six-core CPU; acts as MPGE-2-to-H.264 or H.264-to-MPEG-2 transcoder or MPEG-2/4-to-MPEG-2/4 scaler; receives transport streams several ways, transcodes them and outputs them to an IP network; demultiplexes and streams channels using UDP, RTP or HTTP via IP networks and either IP multicast or unicast streams; transcodes streams into H.264 up to a maximum bit rate of 12Mb/s and MPEG-2 streams up to a maximum of 15Mb/s; provides PID filtering of all unwanted traffic.

858-613-1818; www.dveo.com
Booth: **SU6911**

TECHNICAL FURNITURE SYSTEM
TBC Consoles IntelliTrac

Front and rear device tracks allow unlimited lateral positioning of critical monitors; rack bay turrets may be easily upgraded or relocated, allowing quick, user-friendly modifications; full range of articulating arms for distance, height and tilt control may be used for mounting flat-panel monitors, speakers, phones and task lighting.

631-293-4068; www.tbconsoles.com
Booth: **C12419**

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VidOvation VidLink 1.5G



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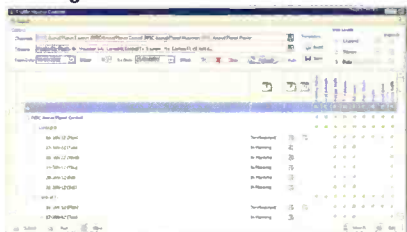
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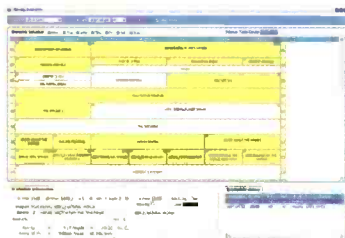


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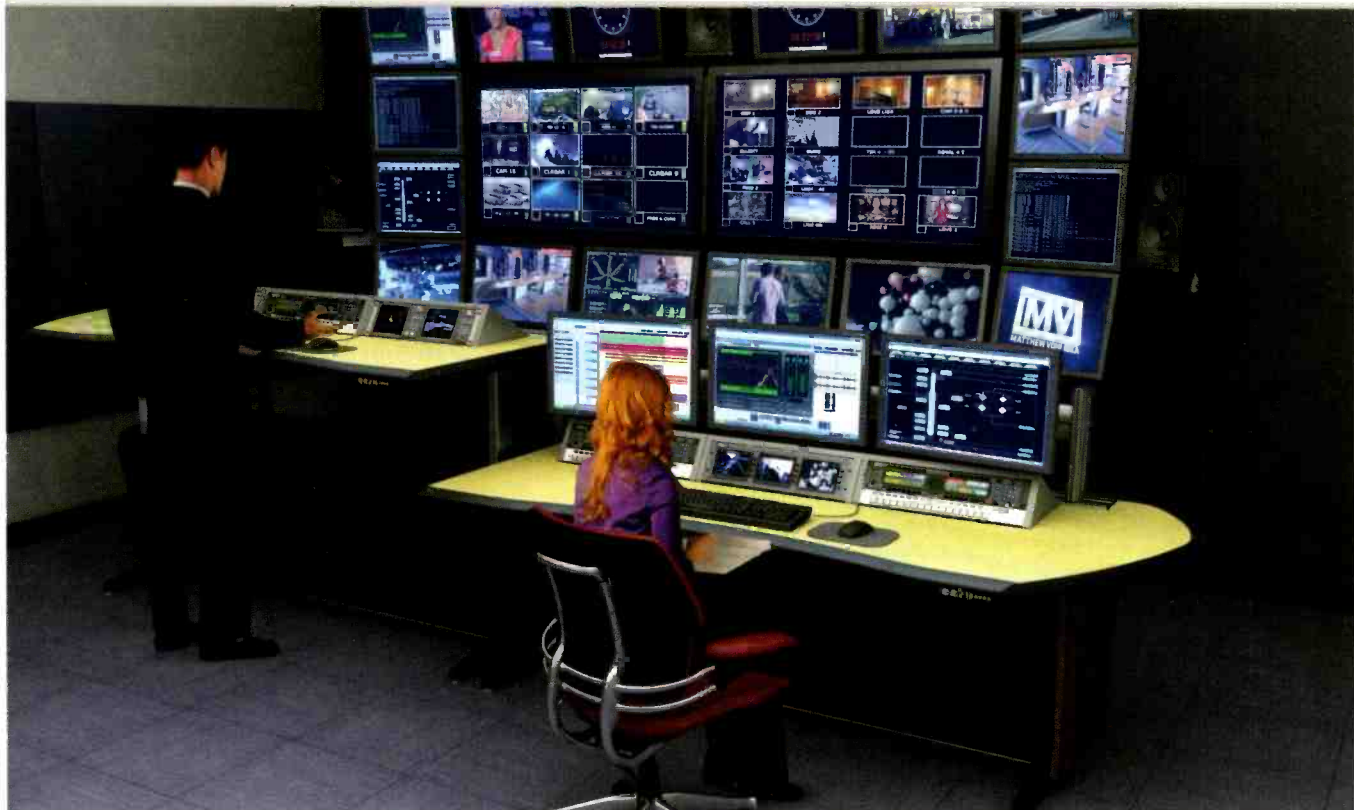


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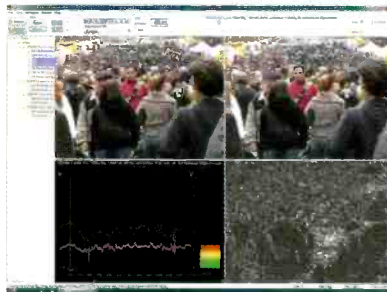
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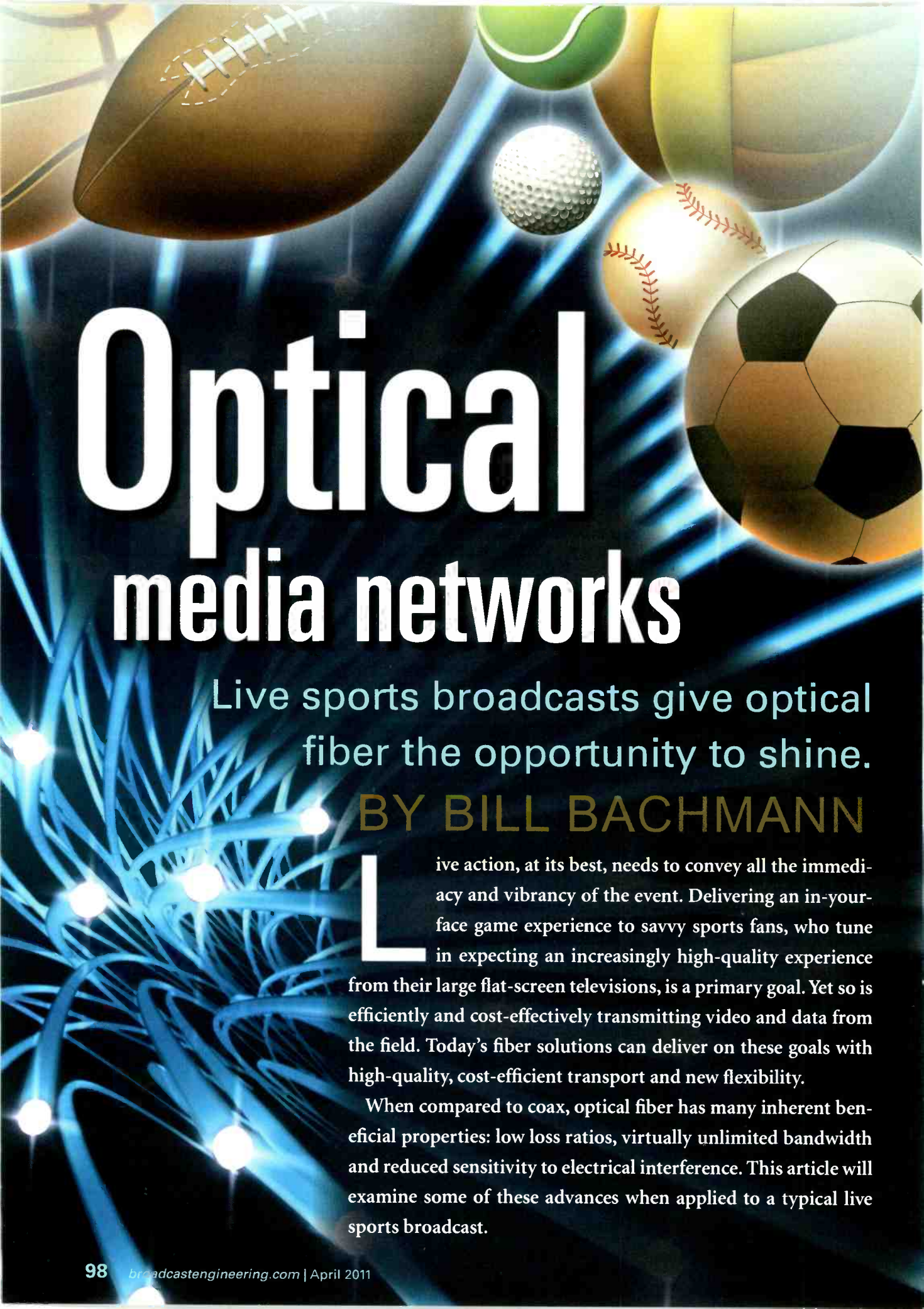
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Optical media networks

Live sports broadcasts give optical fiber the opportunity to shine.

BY BILL BACHMANN

Live action, at its best, needs to convey all the immediacy and vibrancy of the event. Delivering an in-your-face game experience to savvy sports fans, who tune in expecting an increasingly high-quality experience from their large flat-screen televisions, is a primary goal. Yet so is efficiently and cost-effectively transmitting video and data from the field. Today's fiber solutions can deliver on these goals with high-quality, cost-efficient transport and new flexibility.

When compared to coax, optical fiber has many inherent beneficial properties: low loss ratios, virtually unlimited bandwidth and reduced sensitivity to electrical interference. This article will examine some of these advances when applied to a typical live sports broadcast.

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FEATURE

OPTICAL MEDIA NETWORKS

The game plan

In our example, a broadcaster needs to originate a national game. The feed requires three field-located HD cameras, one stationary camera and two portable cameras. Two commentators are situated in a press box above the field. Each location needs to be linked and routed to a production facility and fed to a nationwide audience.

While the challenge may sound simple enough, a range of factors must be considered to obtain an optimal solution — one that delivers the

highest quality, lowest latency and most reliability at a cost-effective price.

There are three basic options available:

- *Option 1: Local on-site production using an OB truck.* In this solution, fiber is used between the cameras and the truck.

- *Option 2: Remote production via transmission over telco circuits.* While cost can be a factor, this is a good option for secure, high-quality transmission and the choice for our example. (See Figure 1.)

- *Option 3: Remote production via transport over a single dark fiber* — if stadium infrastructure supports it. Unfortunately, the likelihood of an installed dark fiber connection is low.

Ultimately, the chosen solution design often depends on factors outside the designer's control, such as stadium capabilities, production equipment selected and then the broadcaster's infrastructure.

This scenario assumes that single-mode fiber is present at all camera locations and connects to a common

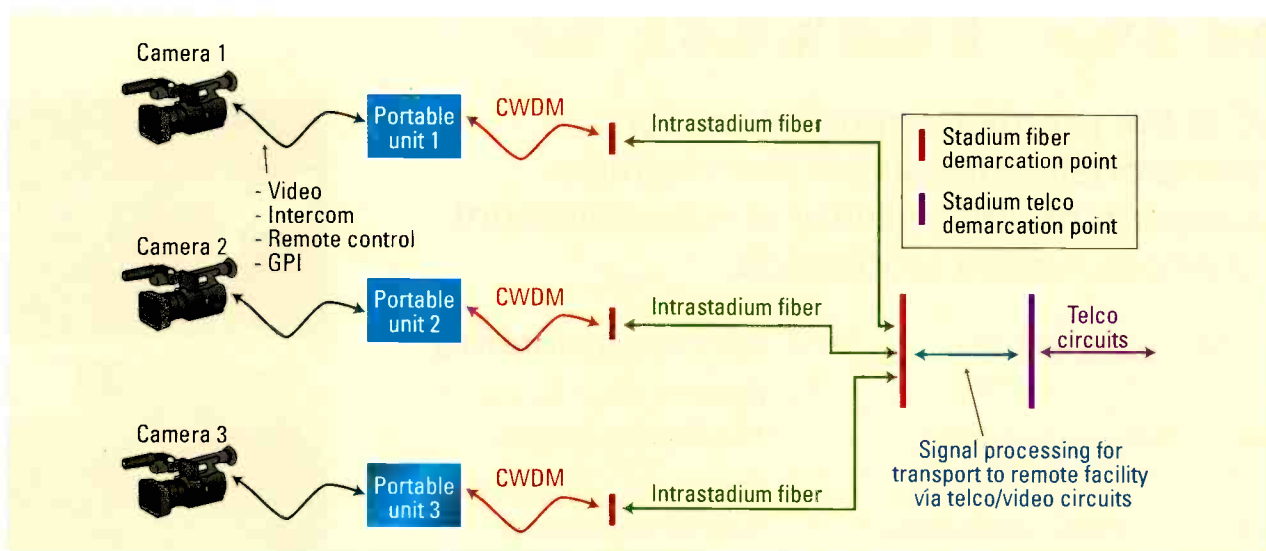


Figure 1. Remote production via telco circuits

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meeting point such as a telco closet, or that fiber can be temporarily run to camera locations from a central meeting point.

The connection point

The first challenge is to connect cameras to the production site or truck. The camera/production connections must support bidirectional HD-SDI video with audio embedding, intercom and remote camera control through standard RS communication and GPI. This ensures that camera operators can view what they are shooting, and producers have complete control, command and communication with talent in the stadium box and on the field. A separate Ethernet connection for comprehensive data

services is also desirable, along with the ability to monitor connections and switch audio signals as required. Finally, the cabling infrastructure can be greatly simplified and setup time

single optical fiber connection is then run back to the demarcation point. (See Figure 2.)

The multiple signals inside the remote box can be optically multiplexed

The cabling infrastructure can be greatly simplified and setup time reduced if all needed signals can be carried on one cable.

reduced if all needed signals can be carried on one cable.

These requirements can be met by connecting each camera to a lightweight and weather-resistant portable housing near the camera position. A

onto a single fiber and brought back to a common location, such as a telco room, where all the remote sites are terminated. The optical signals are converted back to their native electrical formats prior to transporting over

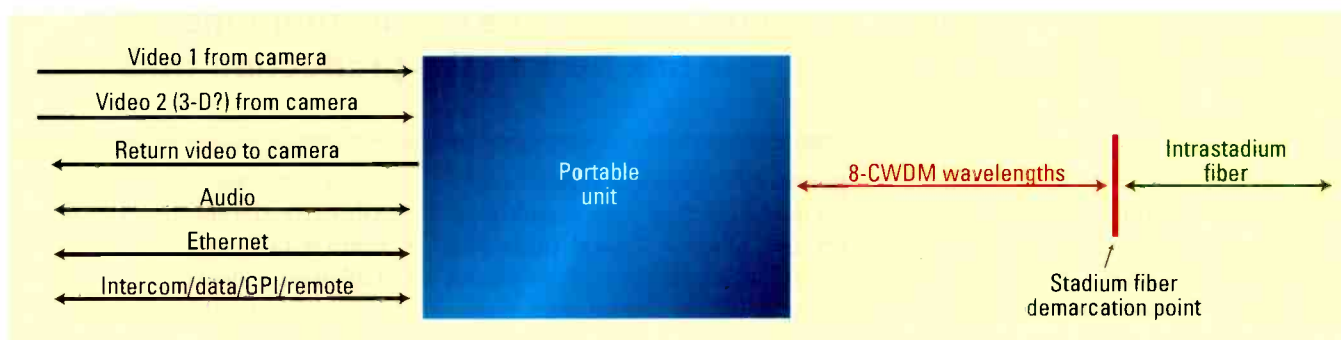


Figure 2. Portable unit configuration with CWDM

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FEATURE

OPTICAL MEDIA NETWORKS

the telco network.

Using native format transport, the three-camera shoot will need:

- Nine HD-SDI circuits: Two HD-SDI signals from each camera location and one return signal to each camera location;
- Three Ethernet circuits: One to each camera location;
- Three or more data circuits: Multiple to each camera location.

Maximum multiplexing with DWDM

Once electrical signals are converted to optical, there are options for transport back to the OB van or production site. Our goal here is to get multiple signals onto a single optical fiber. With dense wavelength division multiplexing (DWDM,) up to 80 separate wavelengths can be multiplexed and transported on a single fiber. However, this application doesn't require that level of integration.

For ease of set up, environmental stability and cost, coarse wavelength division multiplexing (CWDM) is used to combine multiple optical signals onto a single fiber. With CWDM, multiple wavelengths, or frequencies, are wavelength-division multiplexed on one fiber, a process

similar to RF multiplexing on coaxial cable. Multiplexing takes place inside the remote box, so only one connection runs from the box back to the production truck; all bidirectional optical signals are carried on one fiber-optic cable.

Calculating the optical link budget

Calculating the distance an optical signal will travel requires the determination of several key factors: optical output power and optical frequency of the transmitter, the optical receive sensitivity or optical range of the receiver, the length of fiber plus connection

link budget is 30dB.

The common wavelengths used in optical video transport equipment are 1310nm and 1550nm. For design purposes, it is also common to use the following signal loss over a piece of SMF-28 fiber, which is the most common type of fiber deployed for these applications:

- With a 1310nm wavelength, the loss over fiber is 0.35dB/kilometer and typically takes fiber splice and patch panel losses into account.
- With a 1550nm wavelength, the loss over fiber is 0.25dB/kilometer and typically takes fiber splice and patch panel losses into account.

Multiplexing takes place inside the remote box, so only one connection runs from the box back to the production truck.

points, splice points, and passive optical devices such as optical multiplexers and splitters. Typical fiber-optic video transmitters provide an output power of 0dBm. Optical video receivers may have a receive sensitivity of -30dBm. In this example, the optical

Given the 30dB link budget, a 1.5Gb/s HD-SDI signal can travel:

- 85km @ 1310nm
 - 120km @ 1550nm
- Using 60mi for this example:
- Convert 60mi to kilometers (1.61km/mile): $60 \times 1.61 = 96.6\text{km}$

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- Total loss @ 1310nm: $0.35\text{dB/km} \times 97\text{km} = 33.95\text{dB}$
- Total loss @ 1550nm: $0.25\text{dB/km} \times 97\text{km} = 24.25\text{dB}$
- $(\text{miles} \times 1.61\text{km}) \times 0.35 = \text{fiber loss @ 1310 nm}$
- $(\text{miles} \times 1.61\text{km}) \times 0.25 = \text{fiber loss @ 1550 nm}$

The calculations show that an optical transmitter with a 1550nm wavelength will be needed to traverse the required distance while remaining within receiver's acceptable range of sensitivity, -30dBm.

Fiber best practices

There are some important best practices to remember when working with fiber. While many are obvious, like minimum cable bending radius, other seemingly minor ones can bring an installation to an immediate halt.

For instance, the remote box selected here provides a weather-resistant, dust-proof optical connector interface, but patch panels typically have LC, FC, SC or ST fittings. Mating the two different cables requires a *hybrid* fiber-optic jumper featuring two different connectors. The need for jumpers is often overlooked in the design phase, so be sure to have several spares in your toolbox.

When using fiber jumpers, it is important to clean the fiber mating surfaces. I recommend a device such as the CLETOP fiber cleaner. It is also good practice to clean new fibers when unpackaged. Always cap the ends when not in use and never look into a piece of fiber, as you never

skyrocketing price. Yet the cost of fiber-optic cable and components continues to steadily decrease.

Glass does not deteriorate, and as technology advances, glass will remain totally video standards agnostic. A well-designed fiber-optic installation will reduce system cost

The need for jumpers is often overlooked in the design phase, so be sure to have several spares in your toolbox.

know where the other end is or if light is being transmitted through it. An optical power meter should be part of any toolbox to read optical power levels. Be sure your optical power meter has multiple connector adaptors for SC, LC, FC and ST fittings.

Long-term investment

Fiber is often considered costly to install and maintain. Yet, with so many different configurations and connector types now available, the cost has never been lower. Anyone who has purchased copper cabling in the past two years knows of the

and complexity, improve reliability, and remain easy to maintain. Optical components also have long life spans, predicted at 20 to 30 years or more. The key to a winning strategy and execution include carefully considering long- and short-term goals, existing infrastructure, and smart options that take into account the current state-of-the-art technology and equipment. When you do, fiber optics will likely figure into your system.

BE

Bill Bachmann is senior systems engineer at Nevion.

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Automated decision-making

Workflows can be designed to adapt to incoming media automatically.

BY JOHN PALLETT

Across the industry, the power of file-based workflow automation is rapidly expanding to meet today's increasingly high-volume operations. What started as simple data interchange and content repurposing for the Web has developed into powerful video production processes, involving file-based workflow automation systems and sophisticated process design tools. These systems and tools allow many new capabilities, including the ability to add automated decision-making as part of a workflow without requiring custom engineering or human interaction.





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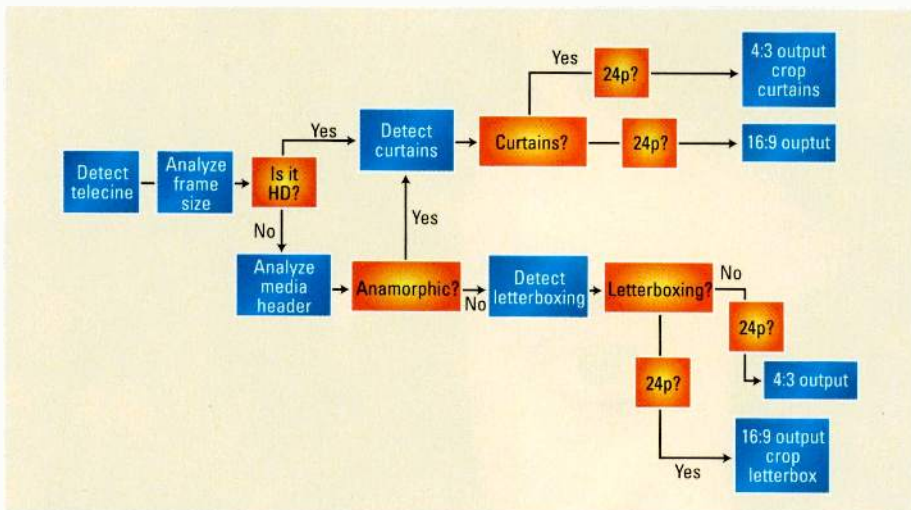


Figure 1. A sample workflow for transcoding

What is automated decision-making?

Automated decision-making is when a video workflow automation system determines which branches of a process to run, based upon data within the workflow, while the workflow is running. The newest generation of tools for file-based video workflow design and automation allow the ability to model and automate this type of decision-making.

Decisions typically can be made upon a wide variety of data present in a workflow. For example, decisions may be made using the results of media analysis — the examination of file headers to determine media properties, extraction of media metadata, video or audio analysis, quality measurements, or reference checks. Decisions might also be made based upon external system data such as distribution rules, air dates or packaging metadata. Further, decisions might involve process control data such as system load, job history or recent failure rates. Finally, automated decisions may simply respond to operator input, providing back-end fulfillment of review-and-approval workflows, packaging from data entry or routing of media based upon operator choices.

Automated decision-making has a broad range of applications, but three common uses are to make the

workflow more intelligent by adapting to incoming media dynamically, to make the workflow capable of responding to errors, and to make the workflow enforce regulatory or contractual requirements.

Smarter workflows

Workflows that adapt to incoming media — such as smart transcoding workflows — generally will combine some form of analysis to determine what work needs to be done based upon media file properties. (See Figure 1.) For example, a transcoding workflow might pick either a 16:9 or a 4:3 output transcoding profile based upon whether the input media file is SD or HD, whether it is anamorphic, and whether letterboxing or curtains are present in the video signal.

Similarly, a workflow might automatically generate transcoding profiles based upon media properties, such as calculating the correct bit rate

to meet a file size constraint, and deciding whether the output meets that constraint. Alternatively, a dynamic profile might be generated to crop off detected black edges in the media, or to perform inverse telecine to create a 24p output if previous analysis determined that the content was telecined.

Automatic error prevention and recovery

Workflows that are aware of potential errors offer the benefit of being able to prevent or respond to problems early in the process, without requiring operator input. Such automation can significantly speed up the detection of — and response to — errors in the workflow. (See Figure 2.)

For example, a workflow can confirm that an incoming file can be read, that it is in the right format and can validate that there were no transfer errors by checking hash values before and after the transfer. In the case where invalid media is supplied, a workflow might e-mail the provider automatically to inform them of the error, rather than waiting for an operator to do so. This automated response can cut hours, and even days, off the recovery from media errors in a workflow.

A workflow can also do diagnostic work to determine the source of an error. For example, if a transcoded version of a video file is of poor quality, a workflow might automatically analyze the input file. If the input file is also of poor quality, the workflow might e-mail the provider. Otherwise, it might try alternate encoding profiles or video filtering to attempt to correct the issue.

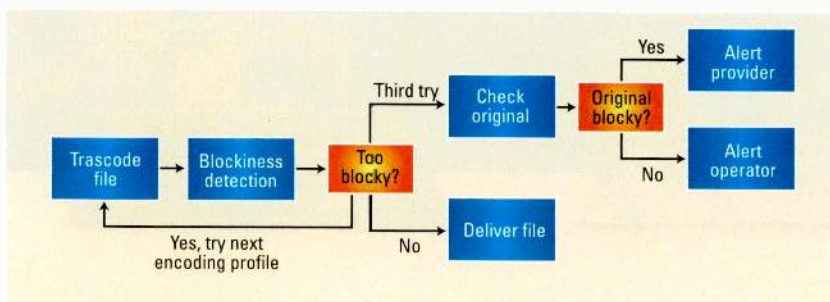


Figure 2. A sample workflow for dealing with blockiness

This type of automated correction is not limited to transcoding quality issues. For example, gamut or level errors can be detected and a workflow can automatically decide whether to correct errors based upon those results. As another example, commercial timelines can be normalized to ensure consistent use of bars, slate and consistent duration. A workflow can decide whether to add or remove material from the timeline automatically, even generating slates if necessary when they are missing.

Regulatory and contractual compliance

Workflow automation can also help with regulatory compliance. For example, a workflow can analyze audio levels and then decide whether to trigger steps to correct those levels. Similarly, a workflow might detect V-Chip ratings and take steps to ensure that adult content does not get sent to family distribution channels.

As a more complex example, a workflow may determine that a media file does not meet caption compliance requirements. In response, it might attempt to insert captions from an associated caption file or flag a clip for review by an operator if a caption file is not available.

Similarly, workflows can automatically assist with contractual compliance. For example, a workflow that is aware of an embargo date might delay the delivery or processing of a file until the embargo date has passed. Similarly, a workflow that is aware of the current system load, and which is also aware of the air dates for material, can make decisions about which material to process first, ensuring that last-minute deliveries are processed in a timely fashion.

It is a fact that a computer is better at some forms of decision-making than a human. If compliance checking is left entirely to people, they may misread an embargo date or hit the wrong button. While computers cannot yet completely automate compliance checks, they can reduce

the number of errors and help avoid penalties and fees.

Business effects

Automated decision-making offers a wide range of business advantages.

First and most apparent, in today's workflows where decisions, error detection and correction are done using

A workflow could analyze audio levels to decide whether to correct them.

manual labor, offloading these decisions to a machine can significantly reduce costs or free up personnel to perform more productive tasks. Further, automated workflows run 24/7, allowing them to respond to media in the middle of the night,

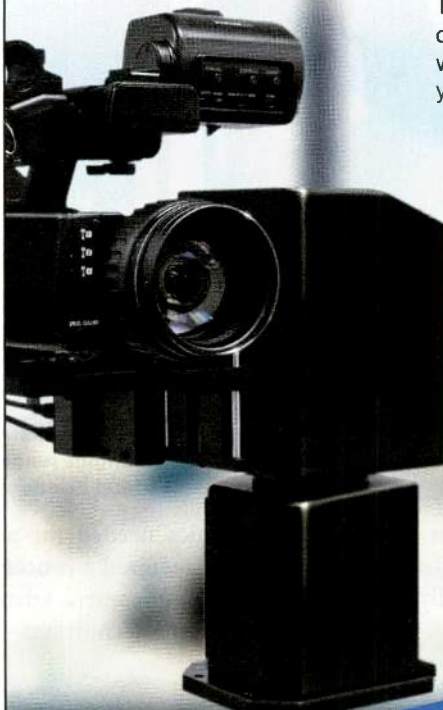
regardless of what labor is available at any given time.

By removing the need for labor, automated decision-making also allows companies to pursue revenue opportunities that were otherwise too operationally costly to justify. For example, companies may accept file-based delivery of local and regional commercials without incurring hefty quality control costs.

Decreasing the number of regulatory or contractual compliance mistakes can help a company avoid fines or penalties. While not all mistakes can be prevented, automated decision-making can streamline the process of identifying and addressing issues, allowing early detection, automated correction attempts and more time for operator recovery when it is absolutely necessary. **BE**


John Pallett is director of product marketing at Telestream.

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Vizrt graphics

Today's news anchors can control studio graphics with their personal tablets.

BY PETTER OLE JAKOBSEN

With the goal of enriching viewers' understanding of the news, networks regularly use virtual sets, video walls, 3D animations and real-time data-driven templates. For special coverage of major sporting events, breaking news or political elections, they may even use all of these graphics systems simultaneously — in an “immersive graphics” environment.

The newscast can feature a virtual set with a video wall displaying 3D animated graphics that are fed real-time scores or vote counts. The HD

all kinds of prepared graphics, video and still elements in any way that fits the story being discussed.

Interactive touch screens, such as those from Perceptive Pixel, let presenters use their hands to expand, shrink, move, change and manipulate the graphics and clips on the screen. They sometimes poke, swipe and wave their hands wildly to control the video and graphics displays while talking about how the visuals relate to the news being reported.

For two decades, live news and sportscasts relied on operators in the control room to plan and playout the

paradigm. The on-camera news anchors can now take the reins on live visual displays without leaving their seats. Using systems like Vizrt's Viz Anchor, they can trigger graphical displays remotely from an Apple iPad, and their selections instantly play on any monitor or screen on the set. Viz Anchor is an app that runs natively on an Apple iPad tablet PC, a mobile handheld device with a 9.7in diagonal multitouch screen.

On-camera personalities often draw attention to this ultra-compact novelty and enjoy demonstrating its operation to viewers. They show



Norway's TV2 deploys Vizrt's Viz Content Pilot content control system and Viz Artist animation design software for elections coverage.



Australia's Channel Nine Network used Viz Virtual Studio and Viz Engine rendering PC with a Shotoku Mini-Jib VR crane for Federal Elections coverage late last year.

screen can become filled with colorful, striking visual elements that can spring open and change dynamically according to story developments.

At the center of this visual explosion is the presenter, who now has the ability to orchestrate the entire graphics show. Most news viewers are familiar with the presenter using a touch-screen display and manipulating

video and graphics needed for air. Graphics playout required a concerted effort between on-camera talent, news producers and technicians in the control room.

Anchors take charge of graphics

New graphics control technology is dramatically changing this traditional

its small screen and how they scroll through the key frames of videos and graphics to choose what they want to display.

As the presenter discusses news stories, he or she can nonchalantly select one or more items by touching them on the iPad screen to trigger their playout on the set. Anchors don't need to stand near the monitor or touch its

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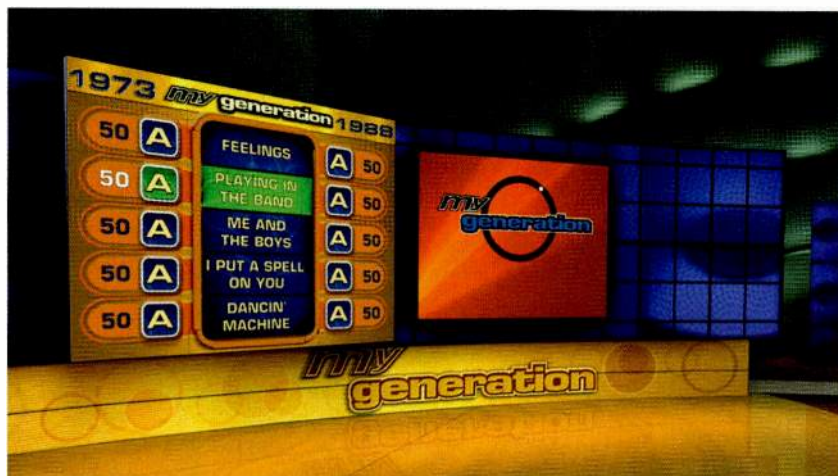
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VH-1's "My Generation" program employs a virtual wall created with Viz Virtual Studio.

screen. They can remain seated and change the graphics and video displays on a whim — even causing a barrage of images to hit the monitor or video wall in rapid succession.

This technology gives viewers the impression that the presenter is an expert, with complete control over the content. They get the sense that the anchor has taken "ownership" of the news assets, and that the news report is unfolding right before their eyes in a fresh, spontaneous way. The graphics are synchronized with the news reports in a way that really underscores the importance of the information.

Displaying instant viewer polls

Since the ultimate objective of any cutting-edge graphics technology is to keep viewers from changing the channel, this iPad app greatly enhances the entertainment and visual appeal of the news or sportscast. This technology also has the ability to interface with social media, such as Facebook and Twitter, and draw viewers directly into the news itself. The anchor can tell viewers that an instant poll question has been posted on Facebook and invite them to respond. An icon would then appear on participating viewers' wireless devices.

Which team do you think will win the Super Bowl? Who do you think will run against President Obama in 2012? Which candidate best

represented your views? When viewers go to vote on issues like these, they use a special "companion app" on their iPads or smartphones to see the poll the anchor just sent them, and then send their responses back to the network.

The results are fed to live graphics templates that are triggered to air from the anchor's iPad. They immediately play out on a monitor or video wall so viewers can see how many votes were cast and what percentages of viewers picked the various choices offered by the poll.

Tying into social media trends

Many of the top news and sports networks are linking their on-air operation to Twitter, Facebook, YouTube and other social media phenomena. The Facebook community has grown to about 500 million users, many of which are active users sharing data with their friends and family on a daily basis.

According to a recent study by Yahoo's Advertising Division, 86 percent of those surveyed indicated that they use smartphones and PCs while watching television, often to browse content related to the show. The youngest bracket that was surveyed — ages 13 to 24 — claimed they used mobile Internet and handheld devices 92 percent of the time while watching television. The study concluded

that viewers using their own tablet PCs and smartphones while watching television were looking to create their own interactive viewing experiences. Asking viewers to use their iPads or iPhones to weigh in on breaking news and topics dovetails with key social media trends and the audience's growing desire to actively participate in the viewing experience.

The companion app required for this instant polling capability is non-proprietary, and networks can hire software companies to develop it for them. But, having that feedback data tie into the live broadcast and specifically to the iPad graphics controller requires tight integration with the live newsroom graphics workflow.

Vizrt offers an integrated broadcast workflow that spans graphics creation (Viz Artist) to graphics systems (like Viz Trio and Viz Content

This iPad app greatly enhances the entertainment and visual appeal of the news or sportscast.

Pilot) and real-time HD/SD rendering (by Viz Engine.) With this integration, the anchor's iPad and the graphics workflow will execute any commands they're programmed to execute to make this instant polling capability a reality.

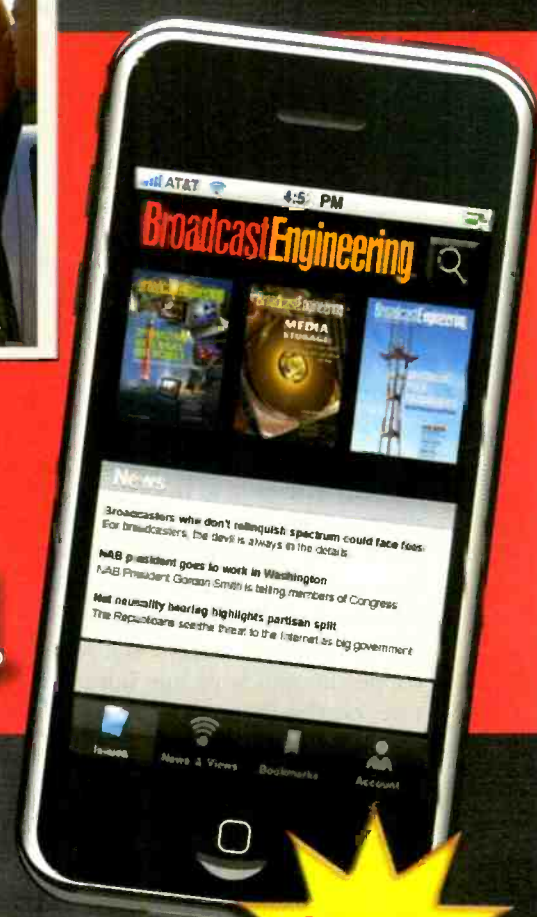
When we tell broadcasters about this new instant polling capability and how it can be integrated with their live graphics workflows, they're very excited about the creative possibilities and view it as a way to stay on the cutting edge. It's another dimension that can be added to enhance the multifaceted immersive graphics environments they're already using to boost ratings and build viewer loyalty. **BE**

Petter Ole Jakobsen is CTO of Vizrt.

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Fiber-optic solutions

Today's HD, 3-D and 3G environments require wide bandwidth connectivity, and using fiber is a good solution.

BY JOHN LUFF

For decades, we have been working with copper connections to our technology. Copper is great, and the available wire technology has evolved to allow us to connect at ever higher bandwidths and over remarkable distances.

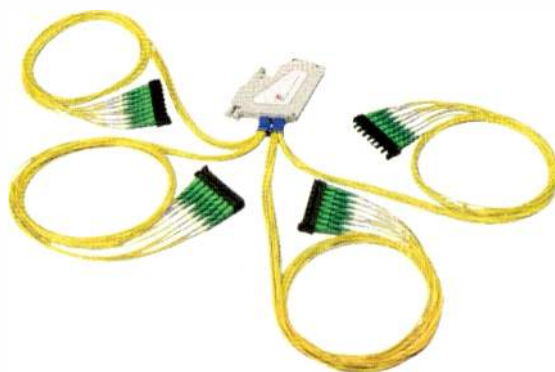
The limitations of wire, distance and bandwidth are due to the analog nature of the medium. It is best to think of wire as a transmission medium, for that truly is its nature. We transmit into wire just as we transmit into the ether, launching signals using impedance matched transmission systems designed to transport the content efficiently and with minimum loss.

Wires that are larger sometimes offer better performance electrically, as in large-diameter speaker cables and RG-8 coax. The trade-off is weight, cost and size. Whether coax, paired cable or specially adapted twisted pair for data (CAT5/6 etc), we still rely on copper for much of our infrastructure, nearly 100 years after commercial broadcasting began.

The development of fiber optics

At the limit of the ability of wire to carry digital signals of high bandwidth, or over long distances, we find the natural desire to extend technology using other media for the physical transmission between devices. A long time ago, analog — and then digital — techniques were developed to use optical transmission media. The hugely higher frequency of light as compared to the electromagnetic spectrum used over wire allows modulation with much higher frequency content.

Over short distances, wire works well into the GHz range, but light allows transmission orders of magnitude higher in data rate. Fiber optics date back to John Logie Baird's experiments with transmission of images down light pipes in the 1920s. Early laparoscopic medical imaging



Fiber-optic splitters, such as the one shown here from ADC, make complex installations more friendly to monitoring.

followed in the 1930s, and in 1952, physicist Narinder Singh Kapany's work led to the invention of optical fiber. Jun-ichi Nishizawa, a scientist at Tohoku University, suggested the use of fiber for communications purposes. A Nobel Prize was not awarded in this field until 2009.

Optical techniques require glass or material with similar optical properties. Generally thought of as fragile and difficult to work with, over the last several decades both the medium (fiber-optic cables) and the connectors and systems used to install fiber optics have made possible simple and reliable systems with extremely high bandwidth and very long distances.

Using fiber

With our industry now routinely sending signals with 3Gb/s and higher data rates, fiber is becoming a critical

part of the infrastructure of modern facilities. The physical principal is that of total internal reflection within the fiber due to the difference in the index of refraction between the fiber and the cladding that surrounds it.

Last month, I wrote about some aspects of a new central switching center that uses almost exclusively fiber-optic connections. The reasons were simple. Coax would limit the ability to send 3G video (SMPTE 424) over long distances within the plant. Fiber would extend the available data rate beyond 3Gb/s to perhaps double the standard developed for 1080p60 signals. That extends the life of the facility far into the future.

We are all comfortable with connectors on coax, but one of the points of nervous concern when planning a fiber facility is the use of connectors we have no experience with, in particular termination. This is frankly for good reason when the termination must be of the highest grade with extremely low loss. Often this leads to a decision to use pre-made fiber, or to hire specialized labor with the skills needed. In modest facilities, installing and maintaining fiber optics is well within the capability of skilled labor.

Part of our reluctance to embrace fiber is based in a lack of experience. Just as properly maintaining a high-bandwidth digital video facility on copper interconnections requires the right test equipment, we also need specialized fiber-optic test equipment to adequately install and maintain fiber plants. A well-equipped video facility these days will have a time

domain reflectometer to allow troubleshooting coax and twisted pair cabling. Networks wired with copper require the right test instruments for their infrastructure.

With optical systems, we need equipment that can launch known power levels into the fiber, power meters to measure the transmission loss and optical TDRs to find return loss problems with connections, splices, and poorly installed trunks. At one time, these instruments were hugely expensive. While generally more costly than test instruments for copper systems, optical instrumentation has come down in cost to practical levels.

Advantages

One of the advantages of fiber is that it can be used as a bidirectional medium. Launching one wavelength in the forward direction and a second one in the reverse direction allows a single fiber to be used for more than one signal.

Similarly, using wave division multiplexing (WDM) can allow multiple signals on one fiber in one direction. Launching multiple signals requires an optical splitter, which can also allow monitoring test points to be created or passive splits of a signal to be created, allowing delivery to multiple locations without duplicating the electrical-to-optical hardware. You might split a signal into three outputs with 30 percent of the energy launched, reserving the last

10 percent for a test point to an optical patch panel where testing can be done without interruption of the signal.

Types of fiber

Fiber itself comes in a myriad of flavors, of course. For field use, it can be strengthened with kevlar threads and protected by thick rubber jackets into what is called "tactical fiber," so named for the military use of fiber optic on the battlefield.

SMPTE standardized both fiber cable and fiber connectors for cameras many years ago, and now a substantial portion of HD cameras installed use SMPTE fiber. SMPTE fiber cable has two optical fibers, and twisted pairs suitable to carry power and intercom that is active before power is applied to the camera head. (This is useful when you want to know if there is a camera on the other end!) Mechanically, the connectors can be built with shutters that protect the inside of the connector from dirt and moisture when they are not plugged into a socket (not mandated in the standard).

Fiber camera cable can be used to several kilometers, where triax would require repeaters at much shorter distances. Fiber is generally lighter and need not be any more expensive in bulk, though connections often cost more than copper connections — particularly in terms of labor needed for termination.

For use inside a facility, often it is more practical to use a single jacket

that carries many fibers. I have a sample on my desk of a rigid fiber system that carries multiple ribbons of fibers all inside a protective "jacket" not unlike PVC pipe. The total number of fibers in that bundle is more than 800! More practical in facilities might be a jacket with a couple dozen fibers. Twenty such cables could connect the entire backplane of a reasonably large routing system, as I described last month. Elaborate fiber management systems have been developed to allow the individual (tiny) strands to be mechanically protected where splices and other connections are made.

Like copper systems, fiber-optic installations need to be maintained over time. But unlike copper, fiber generally ages much more slowly and exhibits very low error rates for many years longer than a copper installation. Suppliers of fiber systems often will organize training on fiber installation and maintenance.

Conclusion

Over time, we will no doubt see a shift towards fiber as a dominant transmission medium. All of us would do well to spend time learning the details of the technology and looking for places where it solves problems in modern television plant design. **BE**

John Luff is a broadcast technology consultant.

? Send questions and comments to: john.luff@penton.com

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HPA Technology Retreat

The event offered demonstrations of a variety of advanced technologies, as well as glimpses of the future.

BY ANTHONY R. GARGANO

A record number of the technical cognoscenti from the worlds of both broadcast and production/post-production were in attendance at this year's 17th annual Hollywood Post Alliance (HPA) Technology Retreat in February. The event featured more than 500 hundred registered attendees and 56 companies demonstrating a variety of advanced technologies, as well as glimpses of the future.

Held once again this year in Rancho Mirage, CA, the days start at 7:30 a.m. with breakfast roundtable discussions and continue with formal presentations and discussion sessions right up until 6 p.m. or so, when there is a short break before the evening dinner or other planned evening event.

While the retreat itself is billed as a three-day event taking place over Wednesday, Thursday and Friday, it keeps expanding. This year on Tuesday, the day prior to the official conference, there was a choice to sit in on either an all-day HPA Supersession on workflow processes or a special all-day ATSC seminar entitled "Symposium on Next-Generation Television Broadcasting." There was even a pre-pre-day session on Monday afternoon on reference displays presented by Charles Poynton, one of today's pre-eminent authorities on the science of color and imagery.

New broadcast concept

In a subject clearly inspired by the FCC's current initiative in television broadcast spectrum reclamation and refarming to broadband services, a presentation called "New Broadcast Concept" created quite an audience stir. The new broadcast concept redefined the broadcaster's business model

as being in the "mass market wireless delivery business." As such, this new model concerns itself with bit rates as opposed to dedicated channel spectrum. The presenters' proposal essentially distilled down to the broadcasters in any given market delivering their content via bit streams over a shared 20MHz OFDM single-frequency network facility.

One audience member commented, "Oh no, COFDM vs. 8-VSB all over again!" I couldn't help but smile and think of the scene from "The Godfather" where they discussed the fact that the rival factions needed a mob war every couple of years to clear the bad blood. I guess there is still some COFDM bad blood out there. Back to the new broadcast concept: Ostensibly, then, lots of spectrum would become available in any market with more than three over-the-air stations. Wow! Would that make the FCC's day! Thought provoking? Absolutely.

The death of 3DTV

Another take-away from the conference is that 3DTV is dead. I have long maintained that 3DTV with glasses is a non-starter. Sitting in a theater for two hours staring at a screen is doable for most people. But television viewing is a social activity, and the necessity of wearing glasses is off-putting to the social interaction that occurs with family and/or friends as you view television together. It is even more problematic with today's younger generation, who, when they do watch television, are heavily into multitasking with texts, twitters and Facebook.

3-D was in the forefront from the conference opening, which began with highlights of the past year, including several surveys on 3DTV

conducted by the Nielsen Company. One question was: "Do you currently own or will you purchase a 3DTV in the next 12 months?" The global response was just 28 percent positive and 52 percent negative, but the U.S. response was even worse at 8 percent positive and 76 percent negative.

The really telling survey was one from CTAM and the Nielsen Company. Consumers who indicated they were actually interested in buying a new TV set in the ensuing 12 months were twice asked the question: How likely are you to buy a 3DTV in the next 12 months? The first time was before actually seeing 3DTV and the second time was after viewing it. The results? Before viewing 3DTV, 39 percent were positive on purchasing, and 31 percent were negative. After viewing 3DTV, the response dropped to 29 percent positive and 43 percent negative! Exposure to this new technology actually caused the consumers' opinion to drop.

The next day at the conference saw an eight-member broadcasters' panel including all the major networks discussing various aspects of the current state of broadcast television. Notable by its absence was the lack of any discussion by the panel of 3DTV.

Next year's event

In the above, I've covered just two of the many sessions that occurred during the week. The retreat is a gem of a technology information resource, and next year's event, which is scheduled for Feb. 13-17 in Indian Wells, CA, is already on my 2012 calendar. **BE**

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